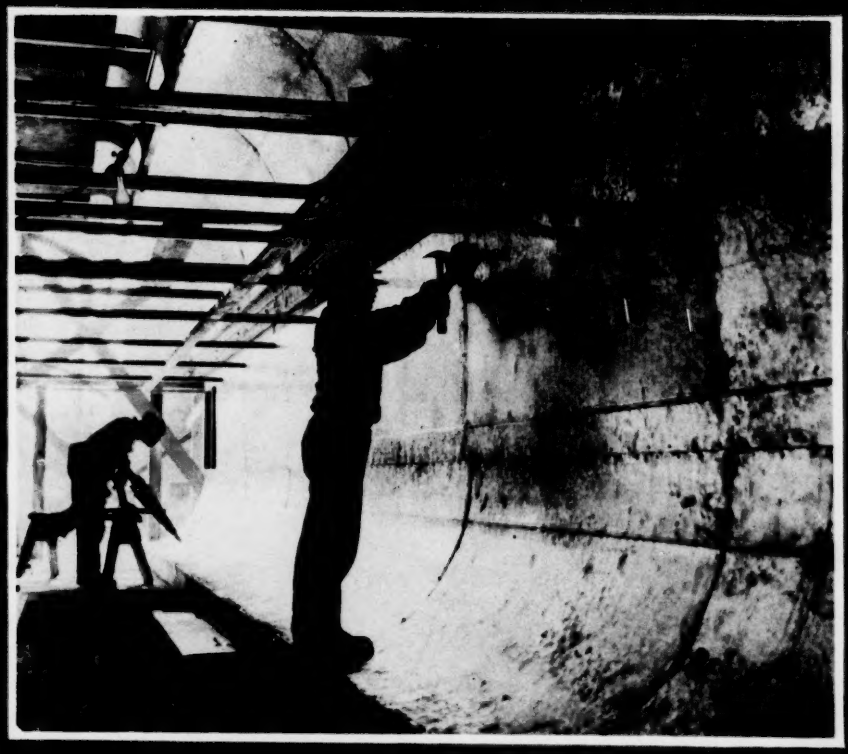
ICE and REFRIGERATION

THE NATI
INDUSTRIAL



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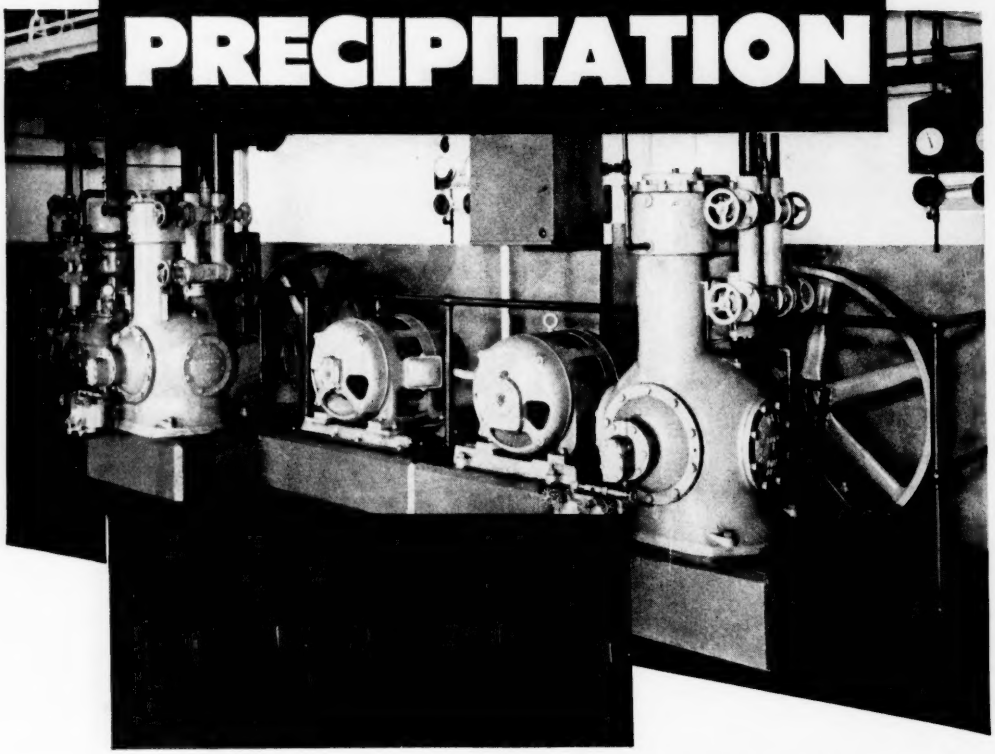
MARCH • 1952

Customers Like "Chicken-on-Ice" New Ice Market . . . . . Page 29

NO WAX PRECIPITATION



The new and improved *Texaco Capella Oil (Waxfree)* assures freedom from wax precipitation *even at temperatures as low as minus 100 F.* Refrigerating efficiency goes up and maintenance costs go down because *Texaco Capella Oil (Waxfree)* keeps compressors clean throughout an extremely wide temperature range.

Texaco Capella Oil (Waxfree) has extremely low floc and haze temperatures *plus* outstanding stability, purity and resistance to oxidation. It has low pour test, is moisture-free and will not react with refrigerants.

There is a complete line of *Texaco Capella Oils (Waxfree)* to bring you greater efficiency and economy regardless of temperature, operating conditions or refrigerants used. Available in refinery-sealed 55-gallon drums, 5-gallon, 1-gallon and 1-quart cans.

Let a Texaco Lubrication Engineer help select the proper one for your compressors. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING COMPRESSORS

Faithfully yours 50 *for Fifty Years*

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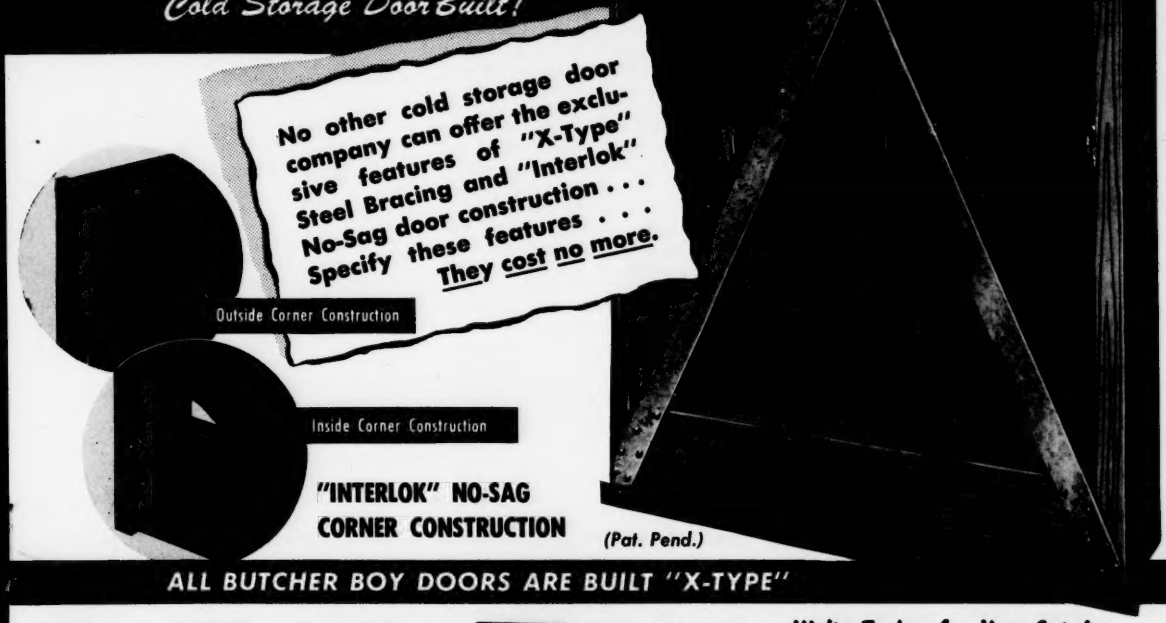
new "X-TYPE" doors

MOST REVOLUTIONARY ADVANCEMENT IN THE COLD STORAGE DOOR INDUSTRY!

Advantages of "Butcher Boy" NEW "X-TYPE" Construction:

1. "X-Type" Steel Diagonal Bracing is the basic principal of RIGIDITY.
2. Guarantees MAXIMUM INSULATION FILL inside of door.
3. The only POSITIVE method to prevent door sagging.
4. Allows REVERSAL OF DOOR SWING if necessary.

The Strongest and Most Durable Cold Storage Door Built!



No other cold storage door company can offer the exclusive features of "X-Type" Steel Bracing and "Interlok" No-Sag door construction . . . Specify these features . . . They cost no more.

Outside Corner Construction

Inside Corner Construction

"INTERLOK" NO-SAG CORNER CONSTRUCTION *(Pat. Pend.)*

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Plywood Door | Track Door | Double Door | Vestibule Door | Low Temp. Door

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To better their performance— these 3 Denver rinks picked a famous partner . . .

Denver Coliseum Rink

Denver Country Club Rink

University of Denver Rink

BYERS Wrought Iron Pipe

When these three major Denver ice skating rinks were built, Byers Wrought Iron pipe was given another significant vote of confidence.

In the Denver Coliseum Rink, over 48 tons of time-tested Byers Wrought Iron pipe was used for the floor piping. Roland L. Linder, Denver, was the consulting architect; Roberts and Schaefer Company—Lorimer and Rose, Chicago —New York, the associate engineers and architects; the ice rink proper was engineered by G. A. Post of Bevington-Williams, Inc., Indianapolis; McCarty-Johnson, Inc., Denver, handled the fabrication.

The Denver Country Club took decisive steps to assure permanence in their outdoor skating rink by specifying genuine wrought iron pipe. More than 49 tons of Byers Wrought Iron pipe was installed. Len E. Rollins and Alfred J. Ryan, Denver, were the consulting engineers; Mitchell and Trautman, Inc., Denver, handled the fabrication.

The University of Denver Arena and Rink, in the University's field house, is safeguarded against excessive maintenance by more than 45 tons of Byers Wrought Iron pipe. The rink, 185 feet long and 88 feet wide, is used for hockey events and recreational skating by the students and public. Charles Dunwoody Strong, Denver, was the architect for the field house and the rink was engineered and designed by G. A. Post of Bevington-Williams, Inc., Indianapolis; Bell Plumbing and Heating Company, Denver, handled the fabrication.

This Denver round-up is another example of genuine wrought iron's widespread acceptance for rink service. You'll find the reasons why this material stays on the job longer, at lower cost per year in our bulletin, WROUGHT IRON IN REFRIGERATION AND AIR CONDITIONING SYSTEMS. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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CORROSION COSTS YOU MORE THAN WROUGHT IRON

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TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

ICE and Refrigeration

VOLUME 122 NUMBER 3

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Published Monthly By
NICKERSON & COLLINS CO.

General Offices
433 N. Waller Ave., Chicago 44, Ill.
Telephones AUstin 7-1303-04-05

LOS ANGELES: Duane Wanamaker
610 S. Broadway, Los Angeles 15, Calif.

WASHINGTON: 1706 L St., N.W.
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ICE AND REFRIGERATION, Vol. 122, No. 3. Published monthly at 433 N. Waller Ave., Chicago, Ill., U.S.A., by Nickerson & Collins Co. Yearly subscription in the U. S., $3.00 per year; other countries, $4.00. Single copies, 35 cents. Copyrighted 1952 by Nickerson & Collins Co. Entered as second-class matter August 8, 1891, Chicago, Ill., under the Act of March 3, 1879. Additional entry at Beloit, Wis.

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Ice and Refrigeration is indexed regularly by Engineering Index, Inc., and is microfilmed for library use by University Microfilms.

March 1952

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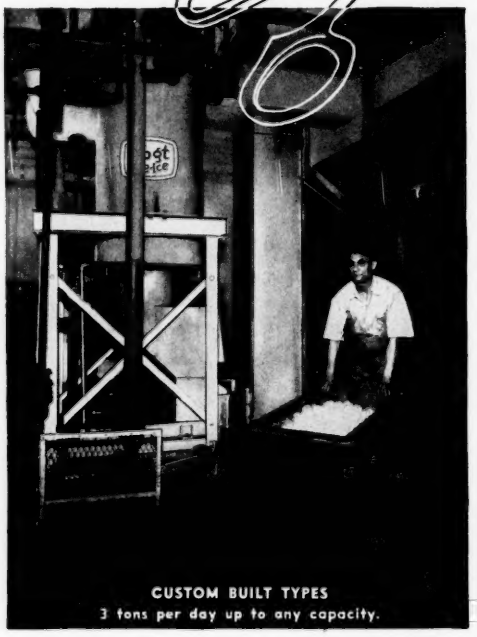
per day capacities

Drastically Cut Ice Making Costs

with the

Vogt *Automatic*

TUBE-ICE MACHINE



CUSTOM BUILT TYPES
3 tons per day up to any capacity.

and here's why:

SAVES SPACE: The 2000 Pound Capacity Package Unit occupies 14½ sq. ft. of space and a 30 ton capacity custom built unit only 64 sq. ft. . . . 90 PER CENT LESS SPACE than required by tank-ice equipment of equal capacity.

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SAVES LABOR: Being wholly automatic in operation and discharging ice in its ultimate sized form, the self-contained Tube-Ice Machine unit requires no labor and only a minimum of supervision.

Write for Descriptive Literature

Patent Nos.: 2,200,424 - 2,239,234 - 2,396,308 - 2,444,514 - 2,453,140.
Other patents pending.

HENRY VOGT MACHINE CO., Louisville 10, Kentucky

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS, CHARLESTON, W. VA.

SPORLAN *Now Offers You* PEAK PERFORMANCE *on* ALL FLOODED REFRIGERATION SYSTEMS

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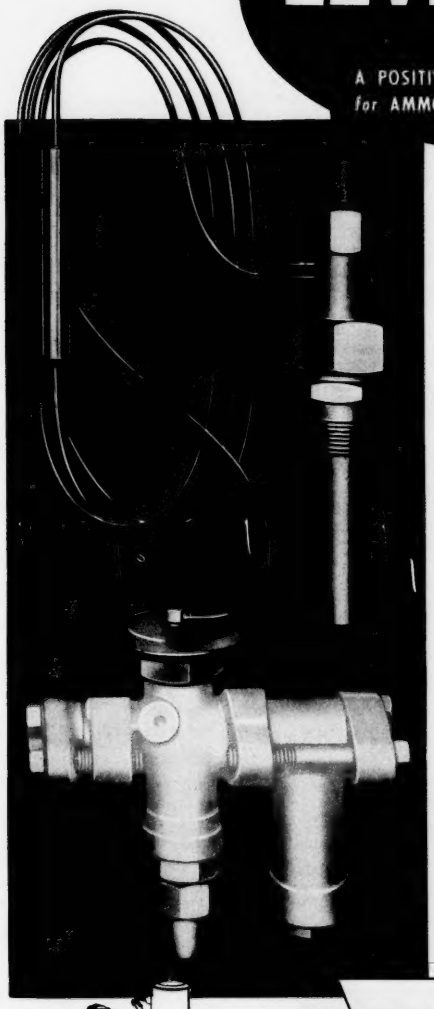
A POSITIVE LIQUID LEVEL CONTROL
for AMMONIA, F-12 *and* F-22 *with* . . .



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1. **Modulated Flow.** The Level-Master Control provides a modulated flow and maintains practically a static liquid level in the low side.
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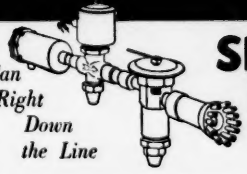
6. **No Current Flow Through Refrigerant.**
7. **Employs Proven Thermostatic Expansion Valve Performance.** Not an electronic device.

The Level-Master Control is a standard Sporlan Thermostatic Expansion Valve equipped with the New Level-Master Element. The Level-Master Element consists of a conventional thermostatic power element, and a low wattage heater. The heater provides an artificial superheat to the thermostatic charge. As the liquid level drops, the heater temperature increases the pressure in the thermostatic element thereby opening the expansion valve. When the liquid level rises and makes contact with the bulb, the refrigerating effect overcomes the heater and the valve throttles.

Write Today **For Copy of Bulletin 60-15 and see why You should use a Sporlan Level-Master Control for YOUR flooded refrigeration systems.**



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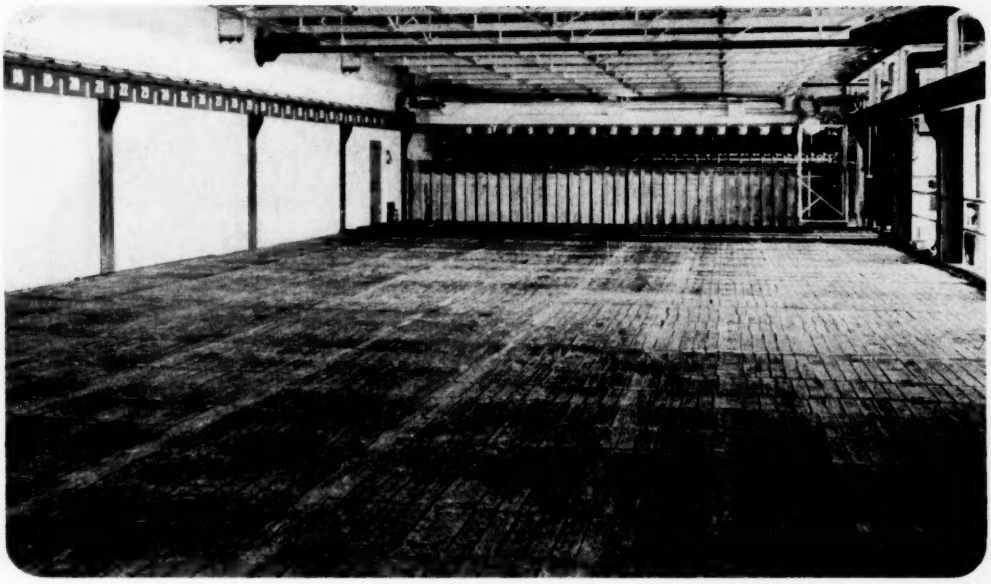

Genuine Oak Ice-Can Covers, Boiled in Linseed Oil

Standard Frick Covers are Made for One or Two Cans

Using selected, seasoned wood, these covers are made with the right spacing between boards to keep them flat in service. Waterproof tar paper is between the layers, which are secured with drive screws; lifting eyes are made oversize. Furnished for one, two, three or four cans. None better. Get yours now, whether needed for a new plant or for replacements.

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FRICK CO.

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"Fine food demands cleanliness so we insist on Packaged Processed Ice"

SAYS W. C. GENTRY, SAVOY GRILL, KANSAS CITY, MO.

For nearly 50 years the Savoy Grill at 9th & Central, Kansas City, has been known for its live Maine lobster, fresh seafood and prime steaks.

One-Trip Paper Ice Bags Put New Life in the Ice Business

PEOPLE who sell food can't take a chance with cleanliness! That's why so many of them insist on buying their ice in Union One-Trip Paper Ice Bags that lock out all dirt and contamination.

And it's lucky for you they do! Consumers ice more often with convenient-sized, easy-to-handle Union Paper Ice Bags. They are easily carried and speed up handling on the platform, in loading and at the delivery point. And the double layer of Union wet-strength, water-repellent paper acts as an insulator to retard melting.

Hundreds of ice companies are now using Union Paper Ice Bags. Write for further information and free samples.

Wet-Strength Paper Ice Bags have tremendous strength even when soaking wet . . . thanks to a water repellent resin that binds the fibres of the paper firmly together

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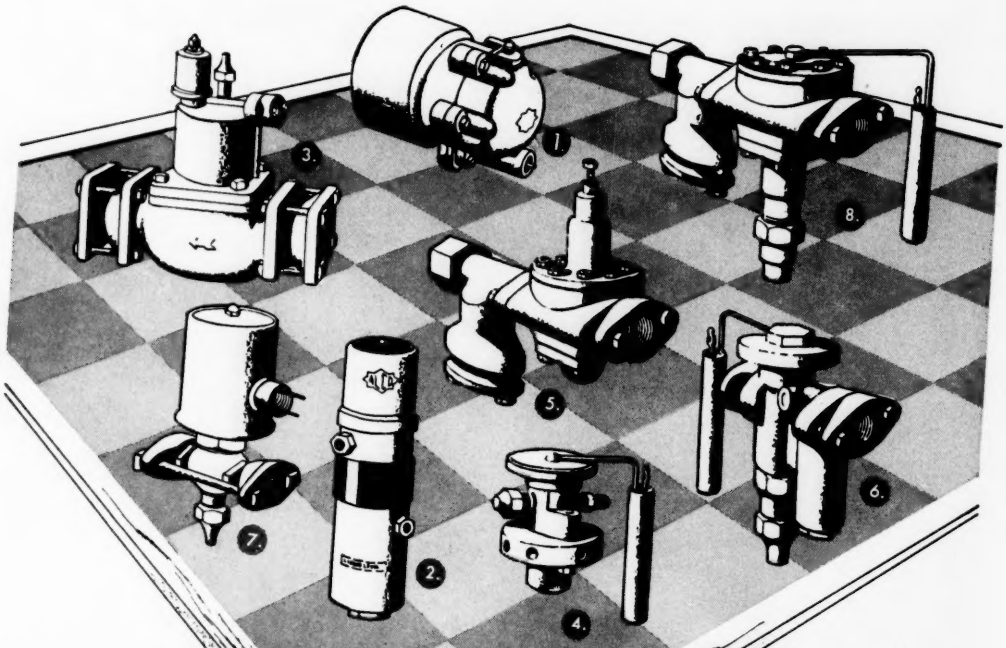

your best move: install ALCO AMMONIA CONTROLS!

With ALCO Ammonia Controls "across the board", you'll have a sure checkmate on excessive operating and maintenance costs. ALCO Controls are ruggedly built for dependable service and long, productive life. They keep your refrigeration system at peak efficiency, producing maximum ice at minimum cost.

Write for our Ammonia Bulletin #172 and SEE YOUR ALCO WHOLESALER

1. **TYPE HK** high pressure float valve. Capacity: 2 to 20 tons Ammonia.
2. **TYPE J5** electric float switch for control of solenoid valves, pumps, high-low level alarms. Up to 460 volts AC and 250 volts DC.
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6. **TYPE UGZ** thermo expansion valve. Capacity: 1 to 20 tons Ammonia.
7. **TYPE M91F** solenoid valve. Capacity: 10 tons Ammonia.
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Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Valves; Float Switches.

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FAST · ACCURATE · ECONOMICAL

For maximum efficiency in ice-tiering operations, Gifford-Wood manufactures three compact, well engineered, portable ice-tiering units. They provide the full range of service needed to handle 300- and 400-lb. ice speedily and safely, in all plants from the largest to the smallest. Built to Gifford-Wood standards of durability.

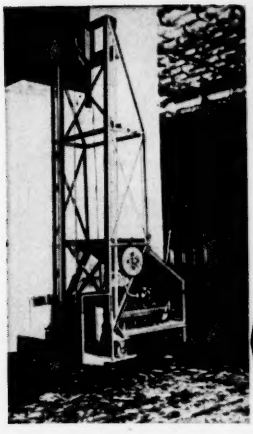
One of these will exactly suit your requirements . . .

TYPE "LA"

An electrically operated (3 hp) automatic tiering machine for 300- and 400-lb. ice. Solenoid type holding brake and cut spur gears to drum shaft, speed 113 fpm, stack to 10 tiers. Complete with visual tier-finder, push-button control, plug and receptacle.

TYPE "N"

Identical in structural design to Type "LA", but motor, brake and winding drum are directly connected to enclosed worm gear reducing unit for compact power drive. Designed for ease of adjustment and accessability. Wired in accordance with Underwriters' specifications.



TYPE "QR"

An electrically driven tiering unit for the smaller plant. Speed, approximately 50 fpm with 1 hp power requirement. Easily moved on two fixed casters by special lift-about attachment. Excellent durability with great portability.

For full information on any of these units have a Gifford-Wood representative call, or write for Bulletin 451.

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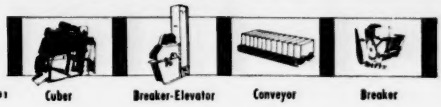
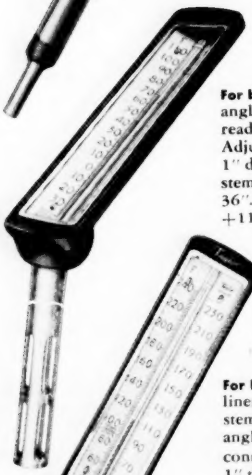


No matter how you look at it —

there's an easy-to-read Taylor Thermometer for every refrigeration job!

For ammonia lines, and insulated brine lines. Range −40 to +118°F. Scale length 7", 9" or or 12", straight stem (shown) or 90° angle. Separable socket connection.



For brine tanks. Oblique angle designed for easy reading below eye level. Adjustable connection, 1" diameter brass stem, stem lengths 12", 24" or 36". Range −40 to +110°F.

For brine and cold water lines. With a straight stem (shown) or 90° angle stem. Fixed thread connection, ½", ¾" or 1" thread. Range 0 to 110°F. or 30 to 180°F.

A variety of stem angles for easy reading in any position are only the beginning of the story. A complete range of bulb and stem types lets you choose a Taylor Industrial Thermometer to give accurate readings, and rapid response, on any refrigeration application. Temperature ranges start at −40°F., go as high 950°F. or equivalent Centigrade.

The thermometers shown are just three of literally dozens of types for **Cold water and Brine Lines, Brine Tanks, Insulated Brine or Ammonia Lines, Condenser and Water Lines, Hot Water and Steam Lines, Ammonia Discharge Lines, and Cold Storage Rooms.**

All Taylor Industrial Thermometers have special 3-times-easier-to-read BINOC* tubing. Shallow one-piece case is rigidly rattle proof and dust proof. Glass is extra thick for extra protection.

No matter what your temperature measuring problem, there's a Taylor Thermometer to help you find the best solution. Ask your Taylor Field Engineer, or write for **Catalog 300.** Taylor Instrument Companies, Rochester 1, N.Y., and Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Reg. Trade-Mark

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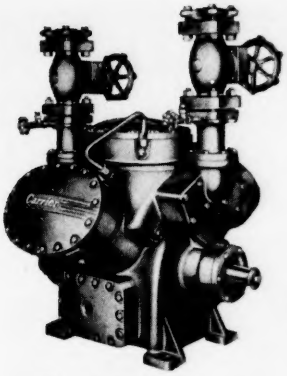
IN HOME AND INDUSTRY



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Reciprocating Compressor

How do valves travel in a modern ammonia compressor?

. . . on cushions. An exclusive feature on our modernized line of ammonia compressors traps part of the gas behind the valves to cushion their opening. This cushion-smoothness for valves means quieter operation and longer valve life.

Another important item in Carrier's new line is the aerodynamic design of all the gas passageways, valve ports and valve discs to produce high efficiencies and low operating costs . . . at *all* loads.

New features like these plus a rugged streamlined crankcase, laid out to make all wearing parts easily accessible, create a heavy-duty compressor with minimum weight and space requirements. Foundations are less expensive. There's greater flexibility of location with respect to refrigeration load. Less piping is required and installation is easier, with reductions in hauling, rigging, and other labor costs.

And to keep maintenance costs down, all parts are precision-made, renewable and interchangeable with a minimum of down-time, requiring no special tools or skills. Write for literature on the Carrier Ammonia Compressors. Carrier Corporation, Syracuse 1, N. Y.

Carrier

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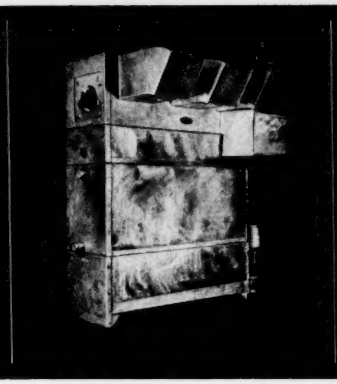
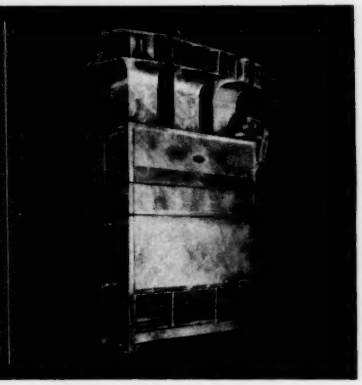
REFRIGERATION
INDUSTRIAL HEATING



Carrier Ammonia Evaporative Condenser

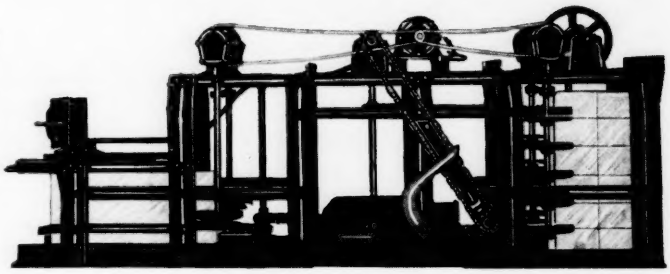


Carrier Ammonia Cold Diffuser

★ *Perfection* A MODEL FOR EVERY REQUIREMENT ★

PERFECTION SPECIAL

The Perfection Special receives ice blocks on edge, scores them and discharges them standing on end. Capacity 4½ blocks per minute or 270 blocks per hour. This is really two machines in one — a combined heading and scoring machine—a sturdily built long-lived machine.



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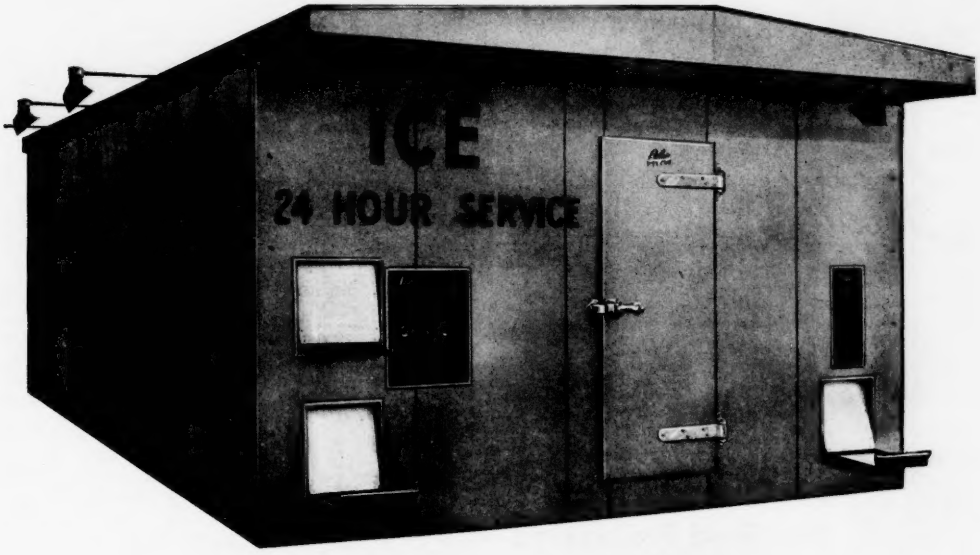

Embossed Aluminum
Gives longer, more economical service

POLAR stations are built in sections to give you:

1. Lower freight costs.
2. Proportional station widths.
3. Ease in enlarging.
4. Easily moved to site with your own truck.
5. Ventilated Roof.
6. Compact refrigeration unit, with automatic defrost.

POLAR vending stations and vendors are built to last a lifetime. Long life and trouble free operation is very important in any capital investment.

POLARS pay for themselves in a short time and give you years of profit making service.

We send one of our engineers to supervise installation of all complete POLAR vending stations at no extra cost to you.

Get your vending stations lined up now. Take advantage of the extra volume possible during the spring months.

We invite you to visit our factory, and inspect our installations in Minneapolis and St. Paul, the ice vending capital of the world.

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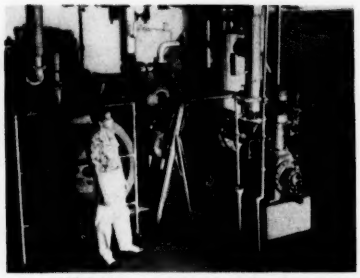
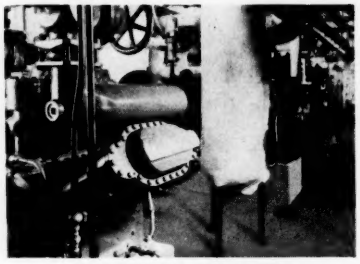
FROM *Shrimp*



CP Refrigeration equipment used in the shrimp packing plant of *Higlera y Congeladora Del Golfo de Cortez, S. A., at Guaymas, Sonora, Mexico.*

TO *Sherbet*



Complete CP Engineered Refrigeration System—*Dean Milk Company, Ice Cream Division, Belvidere, Illinois.*

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WELL!

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Beyond that, they get the year-in, year-out dependability that results from CP progress in building and bettering refrigeration equipment for over 60-years. Add *CP JOB Engineering* to meet the most specific and exacting requirements, and you see why you save time. work and worry when you call in CP, Write us when we can help you.

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typical units from the CP "Balanced Line" of compressors. Write for complete information.

Six cyl. 6½ x 5 Type K Booster

Four cyl. 3½ x 3½ Type K Ammonia Compressor

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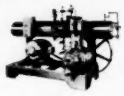

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60 Years Ago

From the March, 1892 issue of ICE AND REFRIGERATION

THE ANNUAL convention of the Southern Ice Exchange was held at Birmingham, Ala., February 23. Wm. J. Rushton, Birmingham, president, presided. Charles W. Biese, Chattanooga, Tenn., was elected president for the coming year. One of the important papers presented was by Mr. Biese on "Distillation and Filtration of Water for the Manufacture of Ice," which ICE AND REFRIGERATION published in full. During a lighter moment the story was told of a thrifty housewife who bought and paid for five cents worth of ice, but said she would take two and half cents worth that day and the other two and a half cents worth some other day.

IN KANSAS several carloads of assorted apples from the famous Wellhouse Orchard in that state had been placed in cold storage in Philadelphia and Baltimore, enabling the owners to obtain a higher price and a surer market. The following May or June it was expected that the apples would be taken out just as fresh as they were packed and would bring, it was hoped, as much as ten cents apiece.

A CONTRIBUTION by D. B. Beemer, a leading cold storage operator of the time tells about a profitable business of storing prairie chickens. These birds were so plentiful in Iowa, he says, that they occasioned serious loss by their marauding inroads upon the crops of small grain and corn. A farmer of an inventive turn of mind contrived a box trap for catching them, and this soon came into general use. Then the catch became so large they were unable to use all the birds and started hauling them to town to trade them for store foods. Some speculative shipper then bought a large number and after freezing them in barrels, shipped them to the Chicago market, and later the Boston and New York markets where they were sold for fancy prices.

NEW ICE PLANTS were being constructed in various parts of the country. With a list of more than a page of such items, the comment is offered that there was moderate healthy activity in building but nothing extraordinary. While some timid investors hesitated to invest because of the size and wide extent of the ice harvest during January and February, still there was no reason to doubt the continued success of the ice factory.

In The Spotlight

FOOD RESEARCH work at the Western Regional Laboratory at Albany, California will be expanded through use of new facilities just installed. Experiments on processing and storage will be conducted in an ultra-modern food factory environment. The research program and modern equipment is described fully in the article on page 17.

A SPECIAL COURSE in Food Technology will be offered by the Massachusetts Institute of Technology from June 15 to July 3. For announcement see page 20.

THE CONSUMERS Ice Company of Lancaster, Pa., looking toward future expansion, has inaugurated three additional businesses, one of which, a packing company, has grown beyond the community stage and is regional in scope. See page 21 for description and pictures.

A NEW APPARATUS for extracting salt from ocean water has been installed in Los Angeles by Peter Jones, refrigeration engineer. See story on page 23.

INCREASED facilities for frozen foods and other storage products are being provided by the Merchants Ice & Cold Storage Company of San Francisco with a modernization program of present plant and construction of new refrigerated space. Description of the modernization and new equipment installed on page 24.

ICE INDUSTRY stories based on information furnished by the Public Information and Marketing Department of the National Association of Ice Industries have had national circulation through the two leading press association services. See story on page 25.

COVER: Sheet metal linings being applied over corkboard on new tunnel freezer at Consumers Ice Plant, Lancaster, Pa. Photo supplied by Armstrong Cork Co. Story on page 21.

A LOCAL ICE MAN of Jersey City, N. J. was honored by a personality and biographical sketch by a newspaper columnist, see page 27.

PRICE ADJUSTMENTS for the Ice Industry are on the way with revision of ceiling price regulation by the Office of Price Stabilization. See announcement on page 26.

CHICKEN-ON-ICE continues as a means of increasing ice sales in many sections of the country. The latest promotional activity was in the State of Florida where a campaign was started by Swift & Company last December. For details see page 29.

AN ICE MACHINE 69 years old, is still in service at the meat packing plant of John Morrell & Company, Ottumwa, Iowa. For story and picture see page 30.

POOR REFRIGERATION plant operation, according to a leading consulting engineer in the refrigeration field, is due directly to the inadequate maintenance and lack of understanding on the part of the chief engineer of correct operating principles. He presents the subject through a series of case histories in the article starting on page 35.

REFRIGERATOR charges amounting to $275,000 a year were made by cantaloupe growers when they adopted a new method of loading.

PRODUCTION and business problems in the poultry industry were discussed at the annual Fact Finding Conference of the Institute of American Poultry Industries held at Kansas City, Mo. February 10 to 12. For report of the conference see page 47.

RESEARCH on ways and means of improving packaging of perishable products to protect quality and avoid waste has been recommended to the U. S. Department of Agriculture by the Cold Storage Advisory Committee. For details see page 51.

IMPROVEMENT of methods of handling fresh fruits and vegetables will be the subject of an experimental study by the University of Illinois in cooperation with the Illinois Association of Ice Industries. For details see page 32.

A FULL PROGRAM of trade discussions and reports and entertainment is planned for the annual convention of the American Warehousemen's Association to be held at New Orleans, La., May 4 to 8. See page 43 for preview.

FEBRUARY, the usual month for natural ice harvesting, is showing exceedingly poor results, according to a news report from Montreal, Canada, and this is expected to greatly increase the output and sale of manufactured ice. See page 52 for full news report.

THE APRIL ISSUE will be the pre-convention number for the National Association of Refrigerated Warehouses, the American Warehousemen's Association and the Refrigeration Research Foundation. (Conventions at New Orleans May 2-8). It will carry the programs, a statistical survey of the refrigerated warehousing industry and other features.

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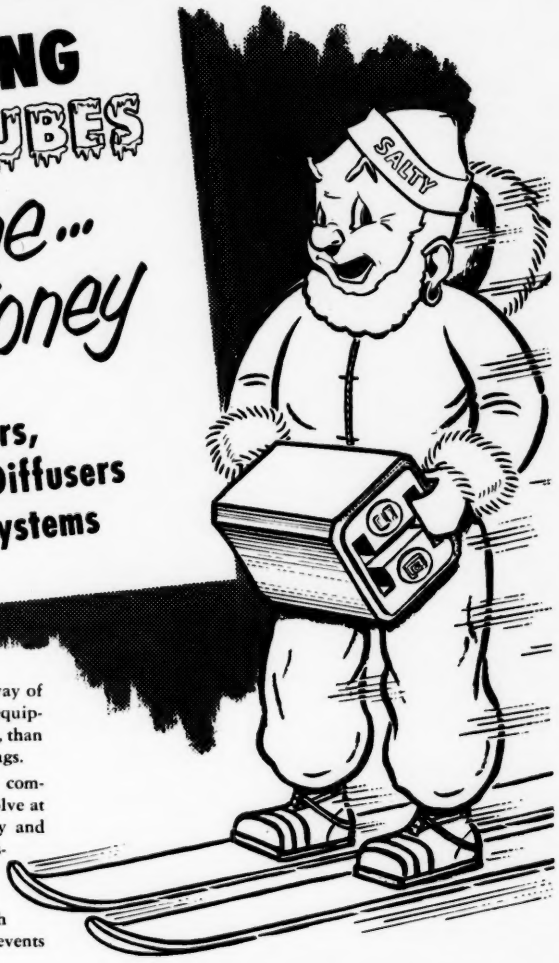
Save Time... Trouble... Money

in Unit Coolers, Brine Spray Cold Diffusers or Spray Deck Systems



NOW PROFIT by this convenient, dependable way of providing steady operation of refrigerating equipment with less attention, less maintenance effort, than former methods of adding loose salt or salt in bags.

Sterling Kooler Kubes are special heavily compressed 50-lb. refrigeration salt cubes that dissolve at an even rate to strengthen brine continuously and uniformly. They eliminate the labor and guesswork of measuring loose salt.

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Sterling Kooler Kubes save on salt consumption, eliminate the troubles caused by clogging of spray nozzles, and help to eliminate fog in chill rooms.

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NEW FACILITIES AID RESEARCH

Food processing laboratory, Western Regional Research Laboratory, Albany, Calif. Some of the 40,000 cans of concentrated apple juice going into the freezer.

Food research work at Western Regional Research Laboratory, Albany, California aided by new facilities including refrigerated storage rooms for study of fluctuating temperatures

New facilities for pilot-plant studies of food research have been acquired by the Western Regional Research Laboratory, Albany, Calif. Studies of effect of fluctuating temperatures, concentration, dehydration, freezing, canning, and other aspects of processing and storage will be carried on in an ultra-modern food-factory environment. The research program and equipment of the re-planned food research laboratory are fully described in this article.

FOOD research work at the Western Regional Laboratory in Albany, California, is now aided by new facilities for pilot-plant studies, segregated in one large, two-story room periments on processing are conducted in a spick and span, ultra-modern, food-factory environment. In the design of the room, flexibility and efficiency of operation received primary consideration. The larger multi-storied room formerly used for all pilot-plant studies will be used largely for non-food research.

Installation of this new food processing laboratory equips the staff for an enlarged food program, including concentration, dehydration, freezing, and canning. Funds were provided in part under the Research and Marketing Act of 1946, which was passed by Congress especially to aid farmers in finding better ways to market their products. Conversion of space from other uses and installation of equipment have been under way over the past two years.

First large-scale use of the new laboratory was made last spring when several thousand 6-ounce cans of frozen concentrated apple juice were prepared for market tests in collaboration with the Washington apple industry. Many other studies are under way, since new processed products offer one of the most effective ways to use certain grades and classes of farm commodities. Such studies are carried on with the major fruits and vegetables and also poultry and poultry products.

Much of this work, particularly on dehydration and on partial dehydration followed by freezing (called "dehydrofreezing") is being conducted in line with objectives established by the Quartermaster Corps. The staff is also exploring the possibility of "dehydrocanning."

Many projects are conducted in collaboration with producing and processing groups. Examples are concentrates or powders made from apples, prunes, grapes, and figs. Dehydrofreezing techniques for apples, peaches, apricots, and peas have been studied extensively and further work is under way. Dehydration research is applied particularly to vegetables (with emphasis on potatoes, green beans, and peas) and to whole egg.

New facilities for processing research on poultry are now available in separate rooms. These new rooms permit study of factors involved from slaughtering on through processing and storage.

New Refrigerated Storage Rooms

Noteworthy also are the new refrigerated storage rooms below the new food processing laboratory. Four of 10 planned are now in working order. They are especially constructed for study of effects of fluctuating temperatures on the storage life of frozen foods and can be controlled from —30 to +40 F. according to any predetermined time-temperature cycle. Researches recently begun in these rooms are especially desired and have been requested by industrial groups who wish exact data for guidance in transport, storage, and retail selling operations.

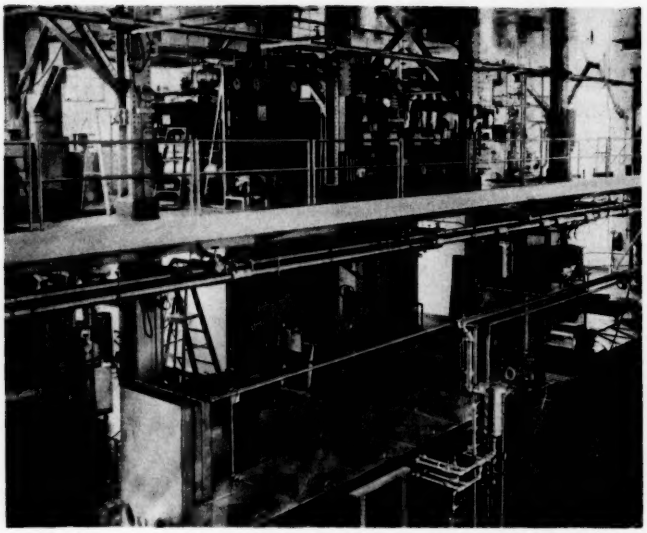
The insulation consists of 11 inches of Foamglas on floors and three inches of Foamglas plus eight inches of cork on walls and ceilings. The refrigerating equipment consists of a special combination F-12 gas heating, direct expansion cooling unit, special electronic-pneumatic liquid feed valve, special pneumatic evaporator pressure control and hot gas flow control valves. There is no humidity control. Room temperatures are programmed and controlled by Brown Electronik temperature controller and time-pattern transmitter unit.

Food Processing Laboratory

The purpose of the new food processing laboratory is to provide suitable working space and large-scale food processing equipment so that skilled personnel can apply research that will broaden the utilization of farm commodities, specifically those used for human consumption.

Design requirements for a good food-processing laboratory are distinctly different from those for a chemical processing area. A food-processing laboratory must be built so that scrupulous cleanliness is easy to attain. Foreign odors, dust, and fumes must be excluded.

The new laboratory has been developed with these requirements as foremost consideration. It is two stories high, 97x60 feet in floor area, with 12-foot mezzanine and 4-foot cat-



General view of food processing laboratory, Western Regional Research Laboratory.

walks. The concrete floor is pitched approximately 3/16 inch to the foot toward floor drains that make a complete loop with six laterals. Four motor-driven exhaust fans in the ceiling can provide an air change in two minutes, to remove process heat and moisture vapor.

Provisions for utility services were carefully planned. The service supply lines must permit a heavy drain on any service at almost any point in the area, since service connection changes are made frequently. The piped utility services include the following: city water in a 3-inch line; special clean steam in a 3-inch line for open or direct-injection heating (55 lbs. generated in a reboiler); house steam for indirect heating (120 lbs.) in a 2½-inch line; condensate return in a 2-inch line; clean compressed air (oil free, water-washed, at 70 lbs.) in a 1½-inch line; vacuum (approx. 1 mm. absolute pressure) in a 2-inch line; gas in a 1½-inch line; high pressure water (600 lbs.) in a 1¼-inch line; and distilled water (60 lbs.) in a 1-inch line. These are carried completely around the area, suspended beneath the 4-foot catwalk for ready access.

A motor-driven 75-hp. rotary compressor, which uses water for pressure displacement and cooling of the air, supplies compressed air suitably uncontaminated for food processing needs. The main cold-water supply can be boosted to 150 lbs. pressure by means of a 50-gallon-per-minute booster pump. Substantially odorless steam is required for certain food processes; this is supplied from a 100-hp. reboiler heated by house steam and fed with softened city water that has been preheated, flash deaerated, and further deaerated by vigorous boiling in an open vessel. Pipe lines which carry this steam are continuously purged. The steam is condensed in a special condensing unit (20 gallons per hour), and the condensate is used as a source of distilled water for the entire building. All utility services are valved so that portable equipment units can be readily connected by flexible metallic hoses.

Electric Service

The primary electrical power service to the area is 208-volt, 3-phase. Heavy load connections are made directly from any one of five 225-ampere circuit breakers. Six load center boxes, fed from the circuit breakers, are mounted at intervals on columns above the catwalks, and conduit lines are run from the nearest load center to lighter equipment. In addition, heavy-duty (30-ampere), 3-phase and 25-ampere single-phase plug receptacles are installed throughout the area at strategic locations. Portable motorized equipment units, up to 10 hp. size, can be readily connected by flexible power cable.

To the extent possible, processing units are portable and are moved on casters or skids, so that food processing lines can be quickly set up, or changed as conditions require. Such tactics aid economy, since floor space then has multipurpose uses.

Water and steam outlets are located at numerous places, so that hose lines used for clean-up will not encumber the whole floor. These particular water outlets are supplied through steam-water mixing units; thus cold, tepid, or hot water is available. A high-pressure booster pump supplying 15 gallons of water per minute at a pressure of 600 lbs. services areas where particularly tough cleaning jobs are located. Safety of these fixtures for operators is assured by standard devices.

Most of the equipment is used to prepare the rather large quantities of carefully processed fruits, vegetables, and poultry products that are needed for a wide variety of physical, chemical, and organoleptic evaluations, consumer acceptance tests, and storage studies. All larger pieces of equipment were designed especially for pilot-plant-scale operation. Maximum processing capacity of the equipment units is, in general, limited to less than 500 lbs. per hour. Some of the major units are as follows:

Major Equipment Units

Rotary Drier: This drier is used for fruits and vegetables in piece form, for example for the dehydrofreezing process, in which pieces are dried to about 50 percent weight reduction. The body of the drier is approximately 12 feet long and 2½ feet in diameter. Product is fed in one end to form a bed within the rotating shell. Hot air at controlled temperature and humidity is blown through the bed of product and can be directed by louvers. Production capacity is fixed by such factors as commodity, moisture content, piece size, final moisture content desired, air flow conditions, and bed depth.

Heat Exchangers for Fluid Products: The three units are essentially rapid heat-transfer equipment of the rotary type for handling purees, juices, and homogenized eggs. The units operate on a continuous-process basis with a maximum capacity of about 500 lbs. per hour. Products can be rapidly heated (5 seconds or less) to sterilize and inactivate enzymes, rapidly or slowly cooled as desired, and slush-frozen. Product temperature is controlled automatically to within ±1F. at the desired temperature level.

Blast Freezer: This unit has a freezing capacity of about 300-500 lbs. of product per hour, depending on product and operating conditions. Cross flow circulation of air is used. The refrigerated air (at controlled temperatures as low as —40 F.) can be blown over, under, and by the prod-

uct at velocities up to 1200 feet per minute. A 15-hp. 2-speed motor drives the blower. Direct expansion of Freon-22 is used to refrigerate the recirculating air stream.

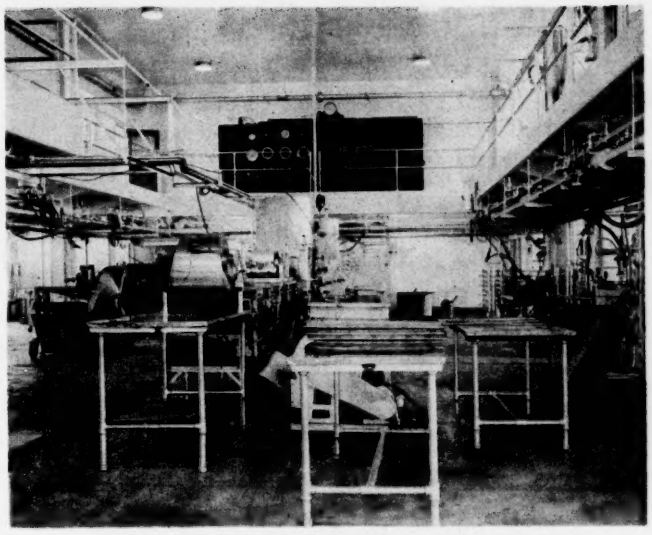
This freezer consists of a cork insulated box approximately 20 ft. 6 in. long, 6 ft. 6 in. wide and 8 ft. 9 in. high, eight inches insulation, plywood exterior, mastic finish interior. Refrigeration is furnished by flooded Belmont liquid-level controlled F-22 evaporators, special pneumatic-type evaporator pressure control valve, water defrost. The freezer temperature is controlled by Taylor filled-bulb pneumatic temperature controller.

Refrigeration Plant: This unit supplies refrigerant to the blast freezer and various other units in the area and serves as stand-by unit for some of the new storage rooms below that are used for temperature-tolerance studies. The plant consists of a Freon-22 compressor driven by a 30-hp. two-speed motor, complete with water-condensing unit, G-E shell and tube condenser, Bell and Gosset shell and tube brine cooler, and 1000-gallon storage reservoir, supply and circulating pumps, and automatic controls. The system is designed to supply brine or Freon for refrigeration of any processing equipment within the area. Rated capacity is about 250,000 Btu per hour at 0 F. and 60,000 Btu per hour at —50 F.

The brine temperature is controlled by a Taylor filled-bulb pneumatic temperature controller starting, stopping, and adjusting speed of compressor.

Vacuum Shelf Drier: This unit is used to freeze-dry products under vacuum. It is particularly effective for removing moisture from heat-sensitive commodities with minimum heat damage. Normally, the product must have a relatively high value per pound for economy of the process. The drier has nine shelves with a total shelf area of about 110 square feet. Heat-transfer fluid can be circulated inside the shelves as well as the jacket. In accord with operating temperature required, brine, cold or hot water, or steam serves as the heat transfer fluid. Temperatures can be controlled and varied from —30 up to +350 F. Absolute pressures as low as 150 microns can be maintained within the drier. Vacuum within the unit can be broken with inert or other bases as desired.

Steam Ejector: This unit services the vacuum shelf drier and is located on the balcony directly above, connected by a 12-inch line. The ejector also serves the utility vacuum service loop when necessary. (Normally a mechanical pump services the loop for reasons of operating economy.) The ejector is a three-stage unit with inter and after condensers. For compactness, the packaged unit was designed with a foot pump, which replaces the normal barometric leg. Capacity is in excess of 70 lbs. per hour of water vapor plus 12 lbs. of air at 10 mm. absolute operating pressure. It can pull down to about 75 microns on dead-end.



Another view of food processing laboratory, Western Regional Research Laboratory, Albany, California.

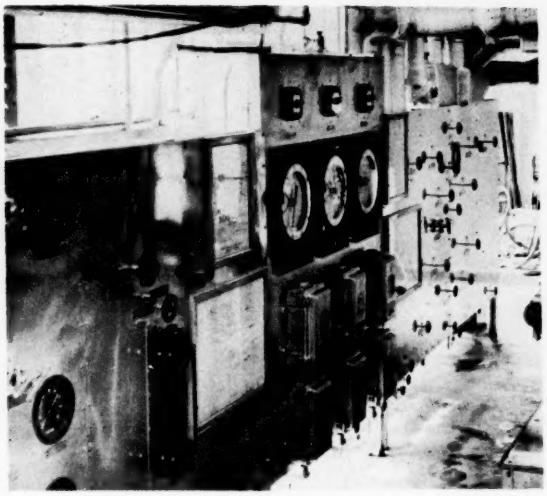
Cabinet Drier: This all-metal dehydrator accommodates six drying trays 2 by 3 feet. It's use is for critical engineering and processing research studies in food dehydration. Cross-circulation air flow is used; velocities are quite uniform and can be adjusted from 400 to 1500 feet per minute. Temperatures up to 300 F. can be attained and controlled automatically by instrumentation. Indirect steam heating is used; direct injection of steam is used for humidity control.

Comminuting Machine: This portable unit driven by a two-speed 7½-hp. motor is used to mill or disintegrate, or homogenize, relatively large quantities of fruits and vegetables for purees, or size-chop prior to juice extraction. For example, whole oranges can be milled in one pass and a product obtained fine enough for spray drying. (The product will pass through on 0.04-inch spray drier nozzle.) Peripheral speed of the cutter is about 16,000 feet per minute. The unit is provided with both manual and adjustable automatic feed.

Slicer - Dicer - Strip Cutter: This portable machine is used to cut fruit and vegetable products to a definite shape and size with a minimum quantity of off-size pieces. It can slice, dice, and strip (Julienne). Dimensions of cut pieces can be adjusted from ⅛ inch upward. This two-speed motorized unit, for example, has a capacity of 6 tons per hour.

Blancher: Essentially the blancher or scalder consists of an all-metal chamber approximately 20 feet long, 2½ feet wide, and 1 foot high, open at both ends. Clean steam is injected into this chamber, and distributed by a carefully designed manifold. A conveyor belt runs the length of the unit and carries the product through the steam-filled chamber maintained at atmospheric pressure. Belt speed is easily adjustable, so that product retention time can be controlled over the range from 15 seconds up to 25 minutes. To attain blanching temperatures below 212 F., clean air is injected into the steam line and well mixed before distribution. The steam-air ratio in the blanching chamber is automatically controlled by instrumentation, so that any desired temperature (in the range of 175 to 212 F.) can be maintained.

Condensers on each end of the blancher prevent excessive quantities of steam from entering the room. Removable lids permit easy cleaning of the chamber. Rolls on the discharge end accommodate the trayed blanched product. Port holes in the chamber wall permit injection of special treating agents, such as sulfur dioxide.



Closeup of instrument panel and control board in food processing laboratory, Western Regional Research Laboratory.

Post-Blanch Cooler: After blanching, the heat retained in the product should be removed, and rapidly in many cases. The post-blanch cooler (located adjacent to the discharge rolls of the blancher) is somewhat similar to, but smaller than, the blancher. The blanched product is carried by conveyor belt through a chamber 12 feet long and 2 feet wide where rapid cooling takes place. Products can be cooled from 212 F. down to room temperature in a few minutes. Provisions have been made for various cooling methods. Air can be blown over the product with either parallel flow, counter flow, or center exhaust. Water-fog can be injected into the air streams to prevent weight loss during cooling. If desirable, water sprays can also be used to flood the product.

Fluctuating-Temperature Storage Rooms

The new rooms for the study of effects of fluctuating storage temperatures on frozen foods are located below the food processing laboratory. The refrigerating system for these rooms is located in the basement and includes four 30-hp. Freon-12 compressors arranged for two-stage compression, and is rated at approximately 15 tons at —45 F. plus 4 tons at 15 F. In each insulated room blowers, ductwork, and a combination heating and cooling heat-exchange unit are mounted, arranged to discharge air of controlled temperature through aluminum shelving located along three sides. Each room is about 900 cubic feet in size and contains about 290 square feet of shelf area.

The room air is heated and cooled by the same "refrigerant." This fluctuation (maximum range —30 to 40 F.) is accomplished by selectively causing the Freon "refrigerant" to extract heat from the room air during cooling in much the same manner as in the household refrigerator, or to add heat to the room air during heating by "pumping" the heat from other rooms that are being cooled. This method of heating is based on the "heat pump" cycle. Although the principle has been well known for many years, and in fact has been utilized to a limited extent in the heating of homes and office buildings, this is probably the first case wherein the heat-pump cycle has been applied in a fluctuating-temperature installation.

Numerous smaller processing units and auxiliary equipment are used in the food processing laboratory. Visitors are always welcome.

M.I.T. Offers Special Course In Food Technology

A SPECIAL program in food technology will be offered at the Massachusetts Institute of Technology during the summer session of 1952, from June 16 to July 3. This course is planned to enable those in the food industry to study recent developments in food manufacture and control. It is also planned for advanced engineering and chemistry students who may desire to investigate opportunities open to them in the field. Food origin and composition will be discussed, as well as food processing, handling, transportation, storage, and control. Emphasis will be placed on related chemical, microbiological, and engineering factors.

Classes

Classes will be held from 9:00 to 12:00 and from 1:00 to 4:00 from Monday through Friday each week and will include the following fundamental topics:

Economics and Statistics of Food Supplies
Equipment Used in New Process
Flavor and Food Acceptance
Food Bacteriology, Sanitation and Fermentations
Food Chemistry and Nutrition (including use of "tracer" elements)
Unit Processes in Food Engineering
Sterilization of Food by Electronics
Food Control Instrumentation
Food Packaging
Materials Handling

Detailed studies of food processing in the following fields will include the following: Brewing, fisheries, food specialties, freezing, juice concentrates, meat packing, and refrigeration.

The Alfred Edgar Burton House, overlooking the Charles River and the Boston skyline, will be available for those participating in the program. Rooms for single men, as well as a limited number of accommodations for married couples and single women, will be reserved if specifically requested in the application for admission to the course. Campus dining facilities, including a snack bar in Burton House, will be open for all meals. Restaurants and hotels are located nearby. Summer guests are invited to use the Institute's libraries and recreational facilities which include tennis courts, the alumni swimming pool, and the sailing pavilion on the Charles River.

Since enrollment in the special course will be limited, early registration is advisable. Preference will be given to applicants having a background of technical, production, or executive experience in food industries, faculty members of other schools, government workers in food control or nutrition, and advanced students in chemistry and engineering. Letters of application including appropriate details regarding experience and background should be mailed to Professor Bernard E. Proctor, Department of Food Technology, Massachusetts Institute of Technology, Cambridge 39, Mass.

Consumers' new 2600 unit locker plant was built in 1946, supplementing two branch operations. The original plant was located in an old freezing storage building that was converted in 1936. An outgrowth of this was Consumers first venture into frozen food packing. In 1940, they entered this business, using the locker plant facilities for processing meats and vegetables.

Community Refrigeration Center

How a progressive ice company, looking toward future expansion developed three additional thriving businesses—freezer storage, food locker, and frozen food packing

THE varied operations into which the Consumers Ice Company of Lancaster, Pa., has ventured since its origin in 1903 present an impressive picture of ingenuity and foresight. Today, like the spokes of a wheel, grouped around one central engine and refrigeration room hub, allied enterprises serve as a true community refrigeration center. One of these, a packing company, has grown beyond the community stage and is regional in scope.

The Consumers Ice Company has been making ice for more than 45 years, and now has a capacity of 90 tons daily, servicing approximately 2500 local customers.

Consumers locker plant, operated by the Ice Company, is one of the most complete in the country. It also has two sub-stations in near-by towns.

This year Consumers Packing Company, only recently divorced from the parent Ice Company, expects to process an all-time high of seven million pounds of vegetables. In addition to those packaged and sold under the "Dutch Farms" and "Consumers" label, Consumers handles custom work for other processors and packs for several national distributors such as Snow Crop, Libby, and Borden.

Certainly the late B. Frank Snavely, guiding force in the early development of the business, could not have completely foreseen that his philosophy of keeping in step with changing demand would eventually lead to establishment of the varied facilities that have supplemented Consumers original ice business.

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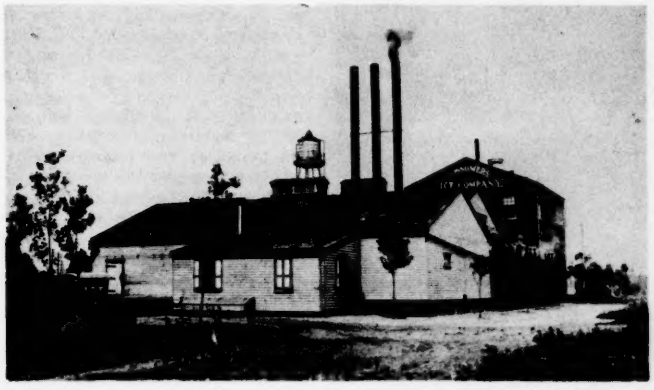
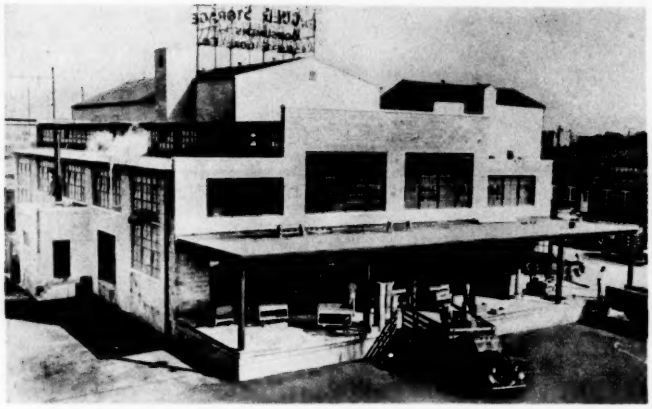


The original ice-making plant, predecessor to the varied enterprises of The Consumers Ice Company, Lancaster, Pa.

Started 48 Years Ago

The Consumers Ice Company as it was known forty-eight years ago, started in a one-story frame building, making ice for domestic and commercial markets. This was a seasonal operation, and Mr. Snavely began looking for a means of supplementing it to offer employees year around work. In 1921, like so many other ice producers in the same predicament, he chose to enter the coal distribution business, and the Company name was changed to the Consumers Ice &



Receiving platform and processing building of Consumers Packing Company, division of the parent ice company.

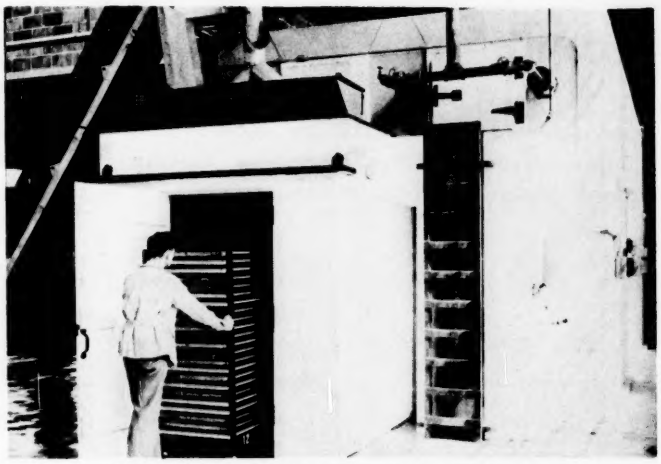
Coal Company. To make it possible for Consumers to manufacture ice in the winter months and hold a portion of their production in storage until the summer season, a new and enlarged insulated storage building for ice was erected in 1918.

In the middle twenties, when the electric refrigerator showed promise of offering serious competition to the ice business, Mr. Snavely decided that it was high time to diversify his operation. This was probably the turning point that led to the company's continuous growth.

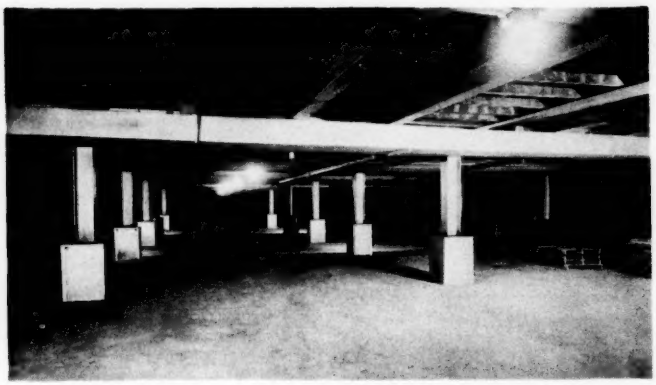
In 1925, to hedge against the refrigerator's inroads on ice sales, it was decided to make room for general cold storage as an added customer convenience. Accordingly, the old storage building for ice was remodeled and part of it was converted into Consumers first public refrigerated warehouse. A year later, a new building was erected for the storage of apples which were grown on the fertile lands of Lancaster County.

General Freezer Storage

The first low-temperature general freezer storage was built in 1930 to supplement the original cold storage warehouse. Until this stage in development of refrigerated storages, "freezers" was a term that applied generally to everything below 30 F. Although Consumers frozen storage was held at temperatures slightly above 0 F., there was still no provision for quick-freezing produce before it was put into storage. However, the term "freezer" storage was being more closely defined and lower temperatures were becoming an accepted prerequisite for quality produce.



Charging hopper feeds produce into tunnel freezer.



The need for more freezer storage space resulted in the recent conversion of existing warehouse common storage.

Although this storage was used primarily for frozen eggs, an increasing number of customers brought in fish and home or farm-killed meat for freezing and storage. This business was never actively solicited, but it grew to such proportions with resulting warehousing problems that the customers were informed that it would be necessary to provide suitably marked containers in which the stored goods could be kept. As an added feature, crowbars were provided to ease the job of freeing stored merchandise.

400 Locker Plant

About fifteen years ago, the term "locker plant" was first being echoed around the country. With the foresight that has always characterized

the business, Consumers, in 1936, installed 400 lockers in their freezer storage building. This was one of the first "city lockers plants" in the country. Two years later, Consumers accepted a suggested renovation design by the Armstrong Cork Company, and 1500 new lockers were installed in the building that was originally built for apple storage. The renovated apple storage turned locker plant also offered facilities for cutting, wrapping, and storing frozen produce.

In 1945, to keep pace with customer demands, plans for a completely new locker plant were prepared. This plant, built in 1946, today contains 2600 lockers. In addition to the processing and cutting facilities common to most such plants, Consumers have coupled personal salesmanship with attractive displays to establish an enviable merchandising record. This added business now accounts for a sizeable percentage of the plant's total annual income.

Frozen Foods Packing

Consumers first venture into frozen food packing was an outgrowth of the locker business. They had been telling their locker plant customers how to process foods and decided that they might try it themselves on a commercial basis. In 1940 the frozen vegetable business was entered, using the locker plant facilities for processing. The first year was anything but encouraging with the gross pack of approximately 40,000 pounds representing almost entirely a hand-processing effort.

Realizing that if they were going into the competitive frozen food field new facilities would be needed, a two-story processing building was built in 1942 that boasted all new mechanical equipment. It was also in this year that walk-in "sharp" freezers for the quick-freezing of produce were installed. As a result, Consumers were able to increase their commercial frozen food pack to 200,000 pounds. Although this figure was very impressive at the time, it is dwarfed by the current 1951 pack of approximately seven million pounds.

That figure has been achieved with processing facilities that are modern and complete. A control laboratory is now housed in what was the meat cutting room of the old 1500 unit locker plant. A four-story 60 x 60 ft. zero degree temperature storage building is adjacent to the processing plant, and approximately three million pounds of frozen merchandise may be held here for final shipment. Four blizzard freezers, one 60-foot-long belt tunnel freezer, one 30 foot 3-track tunnel freezer, one blast freezer, and two contact plate freezers supply the refrigeration requirements of the processing operation.

The central engine room not only supplies the packing company with quick-freezing and storage facilities, but also services the ice making equipment, locker plant, and commercial cold storage warehouses. The process freezing and ice making equipment as well as refrigerated storage warehouses are insulated throughout with Armstrong's Corkboard.

Coolers Converted

Following a trend in the food industry, Consumers have been in the process of converting some of their existing cooler facilities to freezer storage space. Approximately 100,000 cubic feet of old cooler area has recently been transformed into storage space for frozen foods. This will put Consumers in an enviable position, as national customers will be able to store the packed merchandise in the new freezer facilities until demand requires shipment. Consumers still have over 150,000 cubic feet of cooler space available for commercial storage in addition to other facilities that bring their total cooler and freezer facilities to approximately 500,000 cubic feet. This is an impressive figure when you consider that it all originated from a one-story ice-manufacturing business.

New Apparatus Extracts Salt from Ocean Water

CONSTRUCTION of a $50,000 pilot plant to test the design of Peter Jones, Los Angeles refrigeration consultant, for a revolutionary apparatus for desalting ocean water was started in January. He left Los Angeles January for Ralston, Neb., near Omaha, where he was to collaborate with the engineering staff of the Refinite Corporation in building the test plant.

Mr. Jones revealed that his contract with the Refinite Corporation provides that the small pilot plant be completed within the next ten months; that it be able to freshen salt water at the rate of 150 gallons of water an hour; and that, upon completion, the portable plant be made available for demonstration to Los Angeles city officials and heads of other Southern California communities.

The agreement provides further, Jones revealed, that there must be sufficient activity on the part of the Refinite Corporation to sell at least $50,000 worth of the apparatus the first year after the pilot plant is completed, and at least $100,000 worth each ensuing year.

Jones' plan of desalting water by boiling it with a vacuum instead of with fire has, according to the inventor, been favorably reported upon by Dr. Paul Goetz, nationally known industrial chemist.

The proposed pilot plant will be 8½ feet high, 7½ feet long and 4½ feet wide, and mounted on a trailer. In operation it will have a weight of 3,000 pounds. The jet of distilled water spurting from the apparatus would be comparable to that coming from a kitchen faucet.

Jones estimated it would require 100 large desalting plants to supply the city of Los Angeles with the 350,000,000 gallons of water now required daily. The cost to build the 100 plants, he estimated would be between $100,000,000 and $200,000,000.

The technique on which Jones has applied for a patent is based on the principle that water boils at a much lower temperature on a mountain top than at sea level. By introducing a partial vacuum into an appartus placed close to the shore, he explained, the cost of heat would be eliminated from the distillation process.

The apparatus contains a circulation system in which clogging is prevented by the continuous discharge of salt brine and other impurities back into the sea. The inventor and his associates contend it will be possible to sell distilled water to the public at a cost equivalent to that now charged for the Los Angeles domestic water supplies.

Jones revealed that one of the primary obstacles in the path of the efficient operation of the plant, the wetting of both the interior and exterior sides of copper tubing, has been eliminated through some new forms of carbon compounds.

He pointed out that when copper tubing is wet on both sides a serious obstacle to transference of heat is set up, and that even thin films of water inside and outside the tubing slow down heat transfer. The new carbon compounds are employed to coat the copper tubing inside and out, Jones reported. Tests have demonstrated conclusively, the inventor asserted, that the carbon compound coating will keep the tubing surfaces dry when they are submerged.

The progress of the experiment and its final result will be watched closely by the refrigeration industry of Southern California.

Pacific Coast Refrigerated Storage Expands to Provide Needed Facilities

PUBLIC acceptance and the increasing use of frozen foods, lack of adequate storage facilities, rapid rise in handling costs and deterioration of plant equipment are continuous problems in the cold storage industry. The Merchants Ice and Cold Storage Company of San Francisco is meeting these problems with a modernization program of the present plant and the construction of new facilities to meet the temperature and storage conditions demanded of the industry today. The removal of two old buildings erected about seventy years ago and the erection of a modern new building on the site of the old structures is the first unit of the program.

New Features

Several features of special interest have been incorporated in the design of the plant. All floors were kept at the same level so that the products could be handled with fork lift trucks only and that unloading could be carried on at street level on Greenwich Street and at platform level on Battery Street. Requirements of maintaining a temperature of minus 20 F in the holding rooms and minus 50 F liquid temperature in the sharp freezer demand two stage compression for economic operation. These temperatures also impose severe conditions on the insulation of the floor and the aeration of the ground underneath to prevent upheaval of the floor slab that might occur should the ground freeze.

The building has a frontage on Greenwich Street of 275 feet and a depth of 137 feet 6 inches on Battery and Sansome Streets. The structure is subdivided into four units each 68 ft. 9 in. by 137 ft. 6 in. with a clear height of 18 feet in the storage rooms. The rooms are arranged in pairs, two each with loading platform and entrances on Greenwich Street and two with entrances and platform on Battery Street. Each loading platform is 20 feet by 137 ft. 6 in. and directly above them are office floors of the same dimensions. This arrangement makes it possible to use or lease each section as a separate unit with corresponding office and other facilities.

The refrigerating machinery equipment room is located in the rear of the building with its entrance on Sansome Street. Deducting platform and engine room areas, there is left a net storage area of some 29,240 square feet and a volume of 526,320 cubic feet. This volume will provide storage for some 200 railroad car loads of products.

Insulation of Floors

The insulation of the floors presented quite a problem. The plant is located on a fill that was formerly part of the Bay of San Francisco. Salt ocean water was encountered a few feet below street level while excavating for the footings. This water fluctuated slightly with the tide. There is also considerable drainage from the side hills in the vicinity of the site. The floor is composed of a reinforced concrete sub-floor five inches thick, over which is an eight inch cork insulation mat and a four inch thick wearing floor of concrete. The thickness of the insulation in the sharp freezer was increased to ten inches.

Draining the fill under the floor is accomplished by a combination tile drainage and aeration grid work, laid to a grade between the underside of the sub-floor slab and above the highest water level under the building. An open joint clay tile grid work is to be installed, the tile laid to such a grade that any water collecting in the system will drain to the city storm sewer in the streets. Air intakes to the grid system are provided along Battery and Greenwich Streets and an exhaust stack constructed at the highest point of the grid.

An exhaust fan will be mounted on the roof to draw air through the the drainage system. Any moisture condensing out will be drained to the afore mentioned drains to the storm sewer. Eight inches under the drain tile to the underside of the sub floor is to be backfilled with selected material, either river gravel or crusher run rock, carefully placed to form a porous fill. The remaining volume below this selected layer is to be filled with material which is available nearby and which has been proven satisfactory for use as bulk fill.

The side walls and ceiling area are to be insulated with fiber glass, either in board or blanket form. The surface area of the walls and ceiling will be finished with Portland cement plaster. The building itself is to be reinforced concrete construction thruout.

Refrigeration Equipment

The refrigeration equipment layout was carefully planned with several features in mind. The load on each room is 11.5 tons at minus 20 F room temperature for a total of 46 tons for the four rooms. This was the basis of choosing compressor sizes. It was also desirable to install a sharp freezer to handle products from local industries. By installing two booster compressors of equal capacity and two matching main compressors and equipping them with manual pocket control a very flexible design resulted.

The entire plant is automatic in its action through the use of relays and pressure controls but each piece of equipment or the entire plant may be operated manually. The booster compressors from the freezer and storage rooms discharge into a liquid and gas precooler before entering the second stage compression. Through the above relays and pressure controls each piece of equipment may pick up or drop out of operation as the load on the system changes.

All controls are to be mounted on a switch and panel control board in the machinery room, thus centralizing the entire plant. Aero-vapor type condensers and a compressor jacket water cooler is to be mounted on the roof of the engine room and controlled from the engine room switch board. When on automatic operation, the starter button of the first condenser will set the entire plant in operation. Each compressor is locked against being accidently started and can not be placed in operation until the condensers and cooling water pump is started.

Each room is cooled by two refrigerating units coupled to a single accumulator so that each unit may be defrosted separately. The ammonia liquid feed to the units is controlled by a room thermostat and relayed with the fan motors on the coolers. Suction pressure is controlled by a back pressure valve on the suction line to the accumulator of each pair of units. It is thus possible to control each room temperature within close limits.

The sharp freezer room is typical of many other installations, consisting of a pipe coil system built up of 1¼ inch pipe and placed in a bunker

(Continued on page 52)

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

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THIS MONTH IN BRIEF

Ice Industry stories released by the Public Information and Marketing Department of the National Association of Ice Industries have had good circulation among newspapers of the country, providing valuable publicity.

The Office of Price Stabilization has revised its ceiling price regulations to permit ice manufacturers and distributors to apply for adjustments to their ceiling prices.

Promotional activities have been inaugurated in Florida by Swift & Co., Chicago meat packers, to popularize their Premium dressed chicken, processed and displayed on crushed ice. Florida ice men recognize this as a new market for ice.

An experimental study on methods of handling perishable fruits and vegetables is planned by the Illinois Association of Ice Industries in cooperation with the University of Illinois.

A 69-year old ice machine is still operating in the meat packing plant of John Morrell & Company, Ottumwa, Iowa.

Newspaper Stories Get National Publicity for Ice Industry

WELL into January, the Public Information and Marketing Department of the National Association of Ice Industries was still receiving clippings of two ice industry stories released for national circulation last Fall by the Associated Press and the United Press. Both used information sent out by NAII a few weeks before the national convention.

Harman W. Nichols, daily columnist for the United Press, featured the material in his September 26 release, beginning with the query, "Ever wonder whatever became of the iceman?" After reminiscing over the oldtime iceman he remembered from childhood, Nichols went on to describe the extent of the industry today, the modernization of the ice refrigerator, and several more important commercial Ice uses. He concluded by mentioning the 10,000,000 ice refrigerators still in American homes, and the current growth in party ice sales to mechanical refrigerator users.

Clippings to date show that the column has appeared in at least 125 newspapers representing every section of the U. S. Circulation so far approximates 2,569,000, with coverage in the largest cities and the smallest towns.

The Associated Press writeup came from Sam Dawson, AP business writer, on November 12, the day before the national convention got under way. Dawson's opening sentence was "The iceman is still delivering just about as much ice—35 million tons annually—as he did 30 years ago." His full story ran about 12 column inches and touched on domestic Ice refrigeration, hydro-cooling, refrigerator car icing, industrial Ice uses, party Ice service, and vending stations. Known circulation of the AP story to the present totals over 5,000,000 in 245 newspapers.

The clippings also reveal that many editors were inspired by the press service releases to write feature stories on local ice company operations. The Chattanooga (Tenn.) Free Press, for example, combined the United Press column with a picture spread on the services of the Chattanooga Ice Delivery Company. The text and photos together occupied nearly 60 column inches.

A typical headline written for the release was "Obsolete? No! Iceman Still Going Strong".

United Press Release

The United Press release, written by Harman W. Nichols was as follows:

Washington, Sept. 26—(UP)—Ever wonder whatever became of the iceman?

Well, the answer is — he's still shouldering chunks of ice at the old stand, although you probably wouldn't recognize him.

When I was a kid we followed the horse-drawn ice wagon and picked up the chipped-off hunks for free as our hero put half a hundred pounds in the box.

He was a lovable, but overalled character, dripping partly from melted ice and partly from the sweat under his leather shoulder pad.

I have the word of the National Association of Ice Industries that in a lot of places around the world the "ice man still cometh." Today, having survived the invasion of the electric refrigerator, he delivers the big hunks as well as the cubes—same as he did a quarter century ago.

But now he is prettied up in a white uniform, wears a white cap and tips it to the women.

To be sure, he doesn't whip up his nag and ring a bell or look at the window to see if it's 25, 50 or 100 pounds that are needed.

This new guy is strictly big time.

The ice people gave me some statistics, as they looked over three eventful decades of their business.

Today there are more than 6,000 ice companies and they sell a combined total of about 35,000,000 tons of ice each year. That's about what they did in the '20s.

First new thing the old-time iceman did was to lift the face of the old ice box, so to speak. Along came the modern air-conditioned ice re-

frigerator. It was sleek and streamlined. It used ice in a new, efficient way, and being better insulated, it used less ice than the old ice box. It drained right into the plumbing and thereby cut out the drip-pan.

With the small house orders eliminated, the iceman looked for new outlets. He found them in servicing refrigerator cars on the rail lines and in refrigerator trucks. Almost all of them still use ice.

According to John G. Pool, Jr., assistant director of advertising and publicity for the National Association of Ice Industries, the seafood industry would dry up and blow away were it not for ice. Some 6,000,000 tons a year go to protect seafood.

And take fresh growing things. Stuff like sweet corn, cherries, celery, lettuce, peaches, beans, and other varieties of produce that hit the market. These are dunked into an ice water bath immediately after the harvest to remove the field heat and arrest maturity. To chill the water, thousands of tons of ice water are used.

There still are some 10,000,000 ice refrigerators in use.

And to supplement his business, the iceman has proved to some of his old customers that even the best of mechanical refrigerators cannot meet the demand.

Say you are giving a party at home. Your refrigerator can't supply the demand for ice.

So you call on the ice man.

Associated Press Release

The Associated Press release, by Sam Dawson, was as follows:

New York, Nov. 12—(AP)—The iceman is still delivering just about as much ice—35 million tons annually—as he did 30 years ago. And this, in the face of the sale of four million mechanical refrigerators annually in recent years.

Members of the National Association of Ice Industries, meeting this week in Houston, Texas, say they have found new customers in industry to replace the ones they lost in the homes.

They add they have been able to keep some of the old customers by new methods, new equipment and new services. The association says there are more than 10 million ice boxes still in use in the homes. And more than 6,000 ice companies serve the nation.

The ice men's meeting in Texas follows by one week the Chicago meeting of their rivals—the all-industry refrigeration and air conditioning exposition with the latest in mechanical freezing and cooling.

But the ice man is not downhearted. His association reports it's going after still another big market through "hydro-cooling" of produce, developed by research it sponsored. Thousands of tons of ice will be needed, the association predicts.

Hydro-cooling means plunging sweet corn, cherries, celery, lettuce, peaches, beans and other produce into an ice water bath immediately after harvesting, to remove the field heat and arrest maturity. This improves the condition of the fruit and vegetables, says the association. It is also trying to induce more food stores to display produce on ice beds, to keep them at their freshest.

About a third of the ice produced each year goes into railroad refrigerator cars and many refrigerated trucks. The seafood industry uses some six million tons a year for this highly perishable food.

Ice also plays a part in the manufacture of many articles. The association lists chocolate, cigars, ice cream, liquors, drugs, varnish, hats, explosives, sausage, flim and glue.

The iceman got quite a jolt thirty years ago, when the mechanical refrigerator began to sell in volume. Some ice companies were rocked back on their heels. But others set out to save their imperilled business.

Manufacturers changed the old ice box into a streamlined air-conditioned ice refrigerator, better insulated to use less ice, and draining directly into the plumbing to get rid of the greatest nuisance of all—the drip pan that father always forgot to empty in time.

Then the ice companies studied their customers' desires and came up with new methods. Trucks were spruced up and ice routemen put into uniform. Companies began to supply packages of ice cubes, crushed ice, or "sized" ice, as well as cake ice. In many cities, automatic ice vending machines were set up.

Ice Industry Granted Price Adjustments

THE Office of Price Stabilization on January 25 revised its ceiling price regulation for ice to permit distributors as well as manufacturers and harvesters of ice to apply for adjustments in their ceiling prices. The revised regulation, Supplementary Regulation 45, to the General Ceiling Price Regulation, Revision 1, becomes effective January 30, 1952.

OPS said that the profit margins of some distributors have decreased to a point where they are faced with discontinuation of business. Since there are many smaller communities where the only supplier of ice is a distributor, a shut-down could disrupt the supply of ice for home and commercial consumption.

Such a condition, OPS declared, makes is necessary to provide ceiling price adjustments for ice distributors similar to those afforded manufacturers and harvesters. After the effective date of the revised regulation, distributors may make application to their local OPS office for price adjustments. An application form on which the necessary cost and price information may be supplied is provided by OPS.

The revision also permits an ice distributor to increase his ceiling when an adjustment is granted his supplier, or when a distributor has to buy from another supplier who has a ceiling price higher than that of his previous supplier now out of business. Increases in such cases are limited to the exact dollars-and-cents amount by which the distributor's cost was raised over the GCPR base period, December 19, 1950-January 25, 1951.

The revised regulation also permits manufacturers, harvesters and distributors of ice who customarily charge higher prices during the summer months than during winter months to continue this practice by using their 1950 seasonal prices as the basis for their ceiling prices. OPS said the revision would have little over-all effect on the price to consumers of manufactured or harvested ice since the adjustments are expected to be restricted to isolated cases.

Explanatory Note

An explanatory note issued by the National Association of Ice Industries states that contrary to some newspaper and radio reports, the Regulation does not in any manner decontrol ice prices. When SR-45 was issued and made effective last August 1, it provided that ice manufacturers and harvesters thereafter could file applications for price adjustments with their local OPS Field Office. It did not accord this same privilege or opportunity to distributors, dealers, delivery companies, etc., of which there are many in the ice industry. To correct this inequity, OPS was requested to amend SR-45 to cover distributors and the current Revision of SR-45 embodies such an amendment. Instead of issuing the amendment separately, OPS has seen fit to incorporate it in the body of the revised regulation along with the amendment of September 24, 1951, covering Seasonal Price Adjustments.

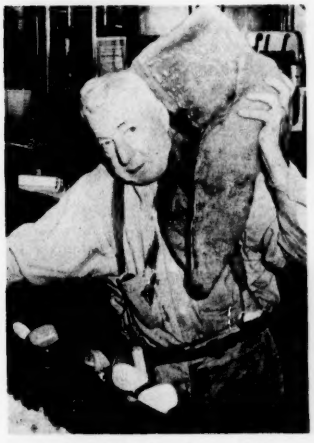
Thus the Revised SR-45 is in the

nature of a collated document containing everything that OPS has issued to date, devoted entirely to the control of ice prices. There are other price problems facing the industry that are not dealt with by this revised regulation. However, efforts are currently under way to persuade and assist OPS in finding their solution.

Newspaper Columnist Honors Ice Man

A LOCAL ice man of Jersey City, N. J., Bill Sheridan, was honored recently by being the subject of a personality sketch by Gene Flinn, columnist, in the Jersey City Jersey Journal under the heading "A Man with Cold Hands and Warm Heart" as follows:

Perhaps you may wonder why Bill Sheridan, now in his 76th year, never becomes tired of toting heavy pieces of ice on his shoulders all day. But when you see how his warm heart melts away all the other troubles around him, you begin to think that maybe the ice he carries is not so much of a burden after all.



Bill Sheridan has been delivering ice in Jersey City for more than half a century. Here the 75-year old ice man is delivering an order of crushed ice—Photo from Jersey Journal.

For Bill delivers more than ice. Folks who know him say his easy disposition and merry sense of humor are more refreshing than his merchandise. In the coldest days of winter when housewives cast a wary eye out the window at the below-freezing temperature, Bill will answer their queries on the weather in the same phraseology that he has incorporated into his homespun philosophy for the past 55 years.

"It's a little windy, but the sun is warm."

Rain or shine, happiness or sorrow, "The sun has always been warm" in his life . . .

A few years before the turn of the century, his father gave him an old horse for a present. Bill hitched his gift to a ton of ice and began his long career. He thus became part of a business in which his role in society was to visit the homes throughout the city every day, leaving a 15-cent piece of ice and a million dollars' worth of smiles.

Of course there were a few ruffles in the smooth life of the Irish iceman. Like the time a Mrs. Murphy called out her window:

Public Relations

"That's a terrible small 10-cent piece of ice your helper just brought me, Bill Sheridan. I want ye to have him take it back and bring me a "daycent" piece."

"Right ye are, ma'am. I'll bring ye another one meself," he answered diplomatically.

As she watched him, he cut a larger piece. Then when the helper returned the original cut of ice to the wagon, he picked it up and took it back. His beaming countenance magnified the size of the ice.

"There ye are, ma'am," he said, fitting the first slab back into her icebox.

"It's a grand man ye are, Mr. Sheridan," she approved. "Now, that's what I call a 'daycent' piece."

Tact is not the only gift of the congenial iceman. Little acts of kindness, such as stopping his horse and buggy to give elderly ladies a ride home from the stores with their bundles, chipping off slivers of ice for the youngsters of the neighborhood on a hot day, mopping up the kitchen when a piece of ice might have left a tiny trail of water, and thousands of other thoughtful deeds, have endeared him to everyone whose company he has graced.

But even a man of Bill's caliber cannot be expected to do everything.

"I have one rule," the elderly man pointed out. "Nothing over two floors."

"When people ask me to bring ice up to the third and fourth floors, I tell them they'll have to meet me on the second floor," he explained.

Then, with a broad wing, he added: "I tell them I have a weak heart."

Bill who works an average 60 hour week, seldom misses a day of work.

"Once in a while I have a pain in me back and have to take the day off. Then I can help me son deliver his ice."

The carefree iceman, who is still able to tote 100 pounds of ice on his shoulder despite his small stature (he stands five feet, eight inches and weighs 160 pounds), has no intention of retiring.

"I don't want to sit in the rocking chair," he protests.

Naturally he uses an icebox in preference to the modern refrigerator in his own apartment. His son, however, delivers the ice.

"We live more than two flights up, y'see," he explained.

And he winked once again.

Appreciates Coverage

I CERTAINLY want to thank you for sending me a copy of the December issue of ICE AND REFRIGERATION. Needless to say I have read it from cover to cover with great interest. Not only was I glad to see the story on the icing of sweet corn, but I was also pleased to see the other articles dealing with various phases of the research program such as Mr. Swartz's speech, Guy's paper and the reports on the various association activities. I always appreciate the very fine coverage which you give activities growing out of the research program.

C. P. Austin, Director
Research and Engineering
Department, N.A.I.I.

Ice Quiz Program Offers Frozen Food Prizes

A GUESSING game for store patrons presented by Mohican Market, Scranton, Pa., awarded packages of frozen food daily to winners. Purpose of the promotion was to promote sales of frozen foods.

Each day during the promotion the store had a package of the food frozen into a cake of ice. Visitors were invited to guess the time when the ice would melt and the package drop to the bottom. The customer guessing nearest to the exact time received 25 packages of frozen foods free. Name of each day's winner and time of the melting was carried in daily newspaper advertisements.

Ice Industry Shows Salad Bar With Display of Iced Produce At Fruit and Vegetable Convention

An inviting salad bar, an attractive display of iced produce, and free literature were the features of the NAII exhibit at the 1952 convention of the United Fresh Fruit and Vegetable Association. The meeting took place January 28-31 at the Hotel Cleveland in that city. Approximately 3,000 of the nation's produce growers attended. A. M. "Andy" Andrich had charge of the Ice Industry booth.

St. Patrick's Day Tip Green Ice Cubes

FROM Bert Dale, prominent hotel-restaurant-tavern columnist comes an idea for boosting St. Patrick's Day ice sales. He suggests that ice companies make green ice for sale to taverns, restaurants and hotels.

"I know it can be done," says Dale, "and I'm going to suggest that restaurateurs and bartenders ask their ice companies to make them available for the Irish holiday. In my columns during February in both Hotel Management and Restaurant Management I plan to promote the idea."

True, there will be many ice company managers who will scoff at the idea because it will seem like too much trouble; but, on the other hand, a number of progressive companies will see the promotion value in offering an extra service to customers. According to the Public Information & Marketing Department of the National Association of Ice Industries, the suggestion has merit. It should be investigated. If you've been looking for greener pastures, you might find them in "green" ice—cubed, crushed, or sized!

Quick Magazine Predicts More Ice Punch Bowls in '52

ON PAGE 37 of the December 31 Quick Magazine appeared a colorful illustration of an ice punch bowl. The caption read: "1952 punch bowl idea: Real ice frozen by your iceman makes a festive bowl for New Year's Eve."

The idea was suggested to Sylvia Schur, Quick Food Editor, by Francis X. Timmons, director of advertising and publicity of NAII. Before going ahead with the picture, Miss Schur requested a check of ice companies which might supply this service. Unit Association secretaries were contacted and came through with prompt information.

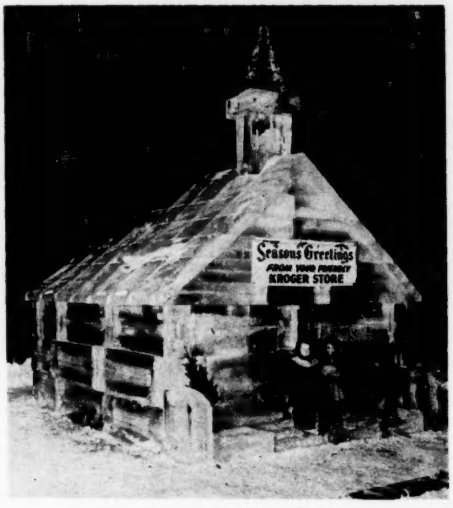
Icemen should be proud of this kind of publicity. Ice punch bowls are newsworthy because of the novel method of preparation, and their dual purpose—bowl and chiller. Except for the front and back covers, the ice punch bowl was the only full-page, full-color editorial illustration in the entire magazine.

The final Quick of 1951 was devoted to predictions for 1952. Heading the list of "predictions in living," according to the fastest growing magazine in America, are (ice) punch bowls for mixed drinks for home parties.

Chain Grocer Shows Church Built of Ice

FOR the Christmas season of 1951, the Kroger Stores in Ft. Wayne, Ind., presented this very attractive church. It was built out of ice by employees of the Ice Delivery Company of Ft. Wayne. The ice used was manufactured by the Moran Ice Company and the Polar Ice Co. of Ft. Wayne.

Thirty tons of crystal-clear ice were used in building the church, which was 10 feet wide and 18 feet high. It was lighted with various colored lights at night. It was an attraction to thousands of Ft. Wayne people, many of whom learned of it from a picture and writeup in a Ft. Wayne newspaper. The builders were Jesse Moore, Ambros Watts, George Hatton, Don Brenner, Lawrence Borcherding, Joe Powers, Forest Hodge and Dick Fischer, all of Ice Delivery. This proved to be such a popular display that already the ice company has been contacted by another Ft. Wayne business concern to build a similar church for next holiday season which it is expected will again attract much public attention.



Church of Ice Built for Kroger.

CUSTOMERS LIKE CHICKEN-ON-ICE

Florida Consumers respond to promotional activities of Swift & Company on Premium dressed chickens, processed and displayed on ice. Offers boost in sales of crushed ice.

THE recent promotional activities of Swift & Company in introducing their famous 'tender-grown" Premium chickens on ice to Florida consumers is good news for Florida ice manufacturers. When the distribution of these chickens became complete throughout the state, advertisements featuring chicken-on-ice appeared in newspapers and magazines at the local, regional and state level. "Tender-grown chickens", displayed on ice quickly became available at leading stores throughout the state. Ice as an efficient and attractive refrigerant was given a big boost by this tremendous new industry, chicken raised just for eating and available the year around.

Kick-off of the large promotional program in the state was on December 29 when the entire Swift Florida sales organization met in Orlando with heads of the company's Dairy and Poultry Department. This meeting was followed by intensive promotions during the months of January and February in eight major Florida cities; Jacksonville, Orlando, Lakeland, Tampa, St. Petersburg, West Palm Beach, Miami and Miami Beach. Swift & Company's home economist, Martha Logan, appeared in leading stores in these towns and made numerous radio and television appearances.

"Chicken on Ice" in the retail store; modern way of displaying dressed chickens imbedded in crushed ice.

Boon to Ice Industry

A big boost to the ice industry has been the pioneering by Swift & Company of the use of ice in providing consumers over the country with fresh frying-size chickens the year around. The use of ice is a key factor in modern processing, packing, shipping, merchandising and even the advertising methods of these new "Tender-grown birds."

Dealers who have never before displayed on ice are fast discovering its effectiveness from the standpoint of eye appeal, flavor, and freshness in poultry selling, and they are adapting it to other product display. Consumer acceptance of chicken-on-ice is easy to measure. In the past year alone, per capita consumption of chicken has jumped from slightly less than 27 pounds to just under thirty pounds. Compare this with the 18.7 pound per capita consumption in 1940, and it's clear that specially bred chickens, available throughout the year has nation-wide acceptance.

The tremendous increase in poultry consumption and the consistant use of ice used in processing and promoting it has been a boon to the ice industry. The conclusion that ice was the best refrigerant for this type of operation was not a hasty one. During the 10 years of research in developing this new chicken, which is especially bred and scientifically fed just for eating, Swift experimented with various refrigeration methods to determine the best way to preserve the birds in their journey from plant to consumer.

At the dressing plant level, the company started research with the actual chilling of the chicken. To remove the body heat in normal coolers usually required from 16 to 18 hours. This meant an extra days delay in shipping. Swift found that direct ice chilling would do the same job in 1½ to 2 hours, so that fresh chickens could be on their way to the consumer that same day that they were processed. Not only that! They also found direct ice chilling to be a superior method of preserving the bloom, flavor, and natural juices of the bird.

Ice is Important

Ice plays its important part in the packing and shipping of these chickens, too. The chilled birds are packed, tagged with the familiar Swift's Premium "tender-grown" blue and white tag for identification, placed on a layer of ice, and covered with more ice. Then the cartons are loaded into refrigerated trucks and sprayed with a blanket of snow. Ice will help preserve the bloom and minimize the shrink of the birds on their quick trip to the retailer.

At the meat market, chickens displayed on ice have made a hit with both retailer and consumer. The retailer finds that his display has

definite eye-appeal. That, coupled with a minimum loss of natural juices in the chickens, helps to increase his poultry sales volume. Also he has found that in addition to being attractive, this method of merchandising is also inexpensive. Display ice of the proper size is approximately ½ to 1 cent a pound, and it takes about a pound of ice to a pound of chicken. The reduction in chicken shrinkage alone more than pays for the cost of ice.

The consumer, too, is pleased with "chicken-on-ice." She knows that she is getting poultry at the peak of flavor and freshness. All the tenderness that is the result of careful raising, chickens scientifically raised just for eating require only about 13 weeks, has been carefully preserved.

Chickens on Ice In Advertising

The use of ice in poultry advertising is a new and interesting trend, too. In contrast to the familiar fried chicken on a platter used in advertisements, the fresh, uncooked bird, displayed on fresh, glistening ice has tremendous appeal.

State-wide distribution of "tender-grown" chicken has just become an established fact, through the recent promotional activities of Swift & Company and various ice manufacturers. "Tender-grown" chicken, displayed on ice, was featured in advertisements appearing in national magazines and state papers, and the company's home economist, Martha Logan, made personal appearances to introduce the chicken in eight major Florida cities.

Information on Display

When dealers want information about displaying poultry on ice, here are suggestions given by the poultry division of Swift & Company.

1—Either turn the meat trays up side down in the case or cover the shelves with two layers of strong water-proof paper. A good grade of building paper is ideal.

2—Spread a 3 to 4 inch bed of ground ice (approximately ½ inch in diameter). This is variously known as "walnut," "pea," or "cocktail" ice. Avoid "snow" or "shaved" ice; they tend to pack down and to crust on top.

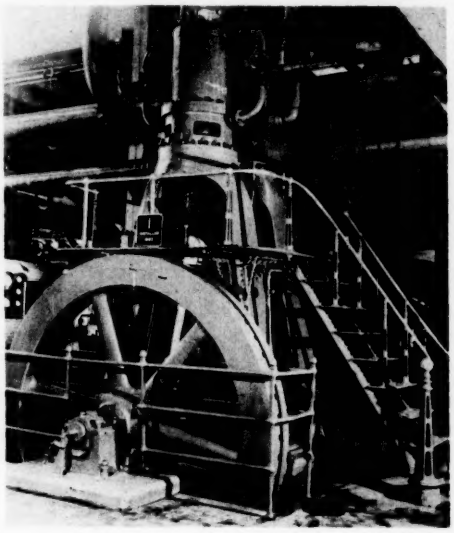
3—Place the birds on the ice bed in even rows then cover with more ice. Next, rake the ice away from the breasts and legs so that they are clearly visible. Be sure to leave the identification tags showing the brand name in plain sight.

4—Garnish with parsley and attach price tag to each bird.

5—After the ice has been in the case for a couple of hours, check the temperature carefully with a good thermometer. It should be between 34 and 38 F for best results. If it is colder, the ice cannot melt properly and consequently cannot keep the birds moist and attractive.

Old Ice Machine Serves Packing Plant Installed in 1883

THE story and picture of the 51-year old ice machine serving the Minden Cotton Oil and Ice Company, Minden, La. in the January ICE AND REFRIGERATION inspired a correspondent to call attention to another old-timer which operates in the meat packing plant of John Morrell & Co., Ottumwa, Iowa. In the March, 1942 issue of ICE AND REFRIGERATION a story and pictures of this machine was published, describing it as one which might actually hold national old-age honors. This could well be since it was installed in 1883, which would make it 69 years old.



To the right is a picture of the 69-year old ice machine serving the meat packing plant of John Morrell & Company, Ottumwa, Iowa. It was manufactured by the Arctic Ice Machine Co. from whom it was purchased and installed in 1883.

Referring back 10 years ago, it was stated then that the ice machine which engineers in the meat packing plant of John Morrell & Co., Ottumwa, Iowa, referred to as "No. 1" might actually hold national old-age honors. Commonly referred to as an ice machine, the engine is really an ammonia compressor used for refrigeration with a capacity equal to the refrigerating effects of 50 tons of ice per day. Though there are six other machines with a total capacity of 2,250 tons in the big Morrell plant, the "No. 1" machine has recently attracted attention due to its age.

Curious as to the history of the old machine, G. M. Foster, vice president in charge of operations, unearthed some information which leads to the belief that it is the oldest ammonia compressor now in use in the country. It is in excellent condition, although used mainly for pumping ammonia out of pipes when repairs are made.

Bearing serial No. 49, it has been established that the machine was manufactured by the Arctic Ice Machine Co. and was built and installed in 1883. It has a 13 by 24 in. vertical double-acting compressor cylinder driven by a vertical 18 x 24 in. steam engine.

A catalog issued by the Arctic Ice Machine Co., and dated January 1, 1885, listed some installations, and among those was the 50-ton Arctic ice machine still in operation at the Ottumwa plant of John Morrell & Co.

Advices from the York Ice Machinery Corp., successors to the Arctic Company, indicate that the Morrell machine was the 49th to be installed. The records show that all but 11 of those built before the Morrell machine have been scrapped.

Los Angeles Claims First Place In Ice Melting Contest

THE Los Angeles Chamber of Commerce was willing but the sun was weak, nevertheless Los Angeles' winter weather came in first as the balmiest, insofar as speed in melting block ice is concerned, over the climates of El Paso, Tex., Phoenix, Ariz., and Carlsbad, N. M.

An ice melting contest participation was made at the Los Angeles International Airport on January 15, simultaneous with similar melting tests in El Paso, Phoenix and Carlsbad. The Los Angeles sun on that day was so coy that it stayed behind the clouds throughout the test period; as a matter of fact, it rained bucketfuls all day. This "liquid sunshine" which was on tap in Los Angeles, is, however, credited with being the factor which won the contest for the California metropolis.

What's it all about? . . . It was a test to determine whether California, Arizona, New Mexico or Texas winter sunshine would melt a ton of ice the fastest.

Started in Carlsbad

Frank A. Kindle of the Carlsbad, N. M., Chamber of Commerce, started the whole thing when he challenged Los Angeles, El Paso and Phoenix to an ice melting test under prescribed conditions. Five other cities subsequently joined in of their own volition—Galveston and Corpus Christi, Tex., Sebring and New Smyrna Beach, Fla., and El Centro, Calif.

The publicity conscious Los Angeles Chamber of Commerce took up the challenge from Carlsbad with great eclat and named Roy M. Hagen, president of the California Consumers Corporation, and a vice-president of the Chamber, as Chairman of the Ice Melting Committee. The California Consumers Corp. supplied the ice.

In conformity with the rules set by the Carlsbad Chamber of Commerce, seven 300-pound blocks of ice were removed from the Jefferson Avenue ice house of California Consumers Corporation at 10:00 a.m. on January 15, under the supervision of A. L. Hussey, manager of the company's ice division.

The ice was stacked solid on a 12-foot platform at the Los Angeles International Airport. The rules provided that the ice be piled at least 25 feet from the wall of any building (no doubt, to prevent any shenanigans, such as a nearby steamline). Floodlights, reflectors or any other aids to melting were prohibited.

The contest started officially when the blocks were taken from the storage building. The rules provided that when the seven blocks had melted down to about 300 pounds, they were to be weighed. When the ice had melted to 100 pounds, with a ton of the original seven blocks gone, the contest was over and the time calculated.

The Los Angeles Chamber chose the airport site on the advice of United States weather forecaster A. K. Showalter, who, the Chamber announced, served as technical adviser in this vital contest.

Los Angeles used a bit of strategy to come out first. It resorted to water instead of sunshine as the melting medium. While the other cities in the contest were flooded with sunshine, the Los Angeles area was drenched with rain, with the sun invisible for 12 hours preceding and 12 hours following the opening of the contest. The Los Angeles sponsors saw the rain as an asset and pointed out sagaciously: "You know what happens when you turn the faucet on a tray of ice cubes."

On hand when the blocks of ice were stacked was Corrine Calvert, Hollywood film starlet, who served as official timer of the Los Angeles entry, and, according to the Chamber, "Is the best little ice melter we could find." Chamber of Commerce officials and half a dozen representatives of the California Consumers Corporation, including President Hagen, braved the elements to see the contest get under way.

Temperatures at starting time were: Los Angeles 40 degrees; Phoenix 37; Carlsbad 49; El Paso 40; El Centro 40; Corpus Christi 69.5; New Smyrna Beach 70; and Sebring 69.

Los Angeles Claims Title

When the 2100 pounds of ice at the Los Angeles Airport had dwindled to 100 pounds at 12:44 a.m., January 16, for an elapsed melting time of 14 hrs. and 44 min., the Los Angeles Chamber claimed the title, since reports disclosed that El Paso, Phoenix and Carlsbad were still saddled with considerable ice at that time.

Galveston, one of the five cities that joined in after the original four had arranged the match, also claimed the title. The Gulf City reported that its ice had melted away to 83 pounds in 12 hours and 45 minutes. Rival entries, however, including Los Angeles, decided to ignore the Galveston claim since the Texans were alleged to have started at 9 a.m., one hour before the official starting time. This situation was expected to result in the filing of protests of some kind. The Galveston Chamber of Commerce asserted that the humidity caused the rapid melting of the ice.

Corpus Christi claimed that its 2100 pounds of ice, stacked at 10 a.m., had melted away to 100 pounds by 10:26 p.m. the same day, or 19 minutes less than Galveston and 2 hrs. 18 min., less than Los Angeles. Los Angeles backers decided to regard as legitimate entrants only the original ones —El Paso, Phoenix and Carlsbad— and to continue claiming the title on that basis. The official winner, however, will not be known until the pronouncement comes from Mr. Kindle of Carlsbad, N. M., who dreamed up the whole thing.

Marketing Research Produces Savings

IMPROVEMENTS in marketing that save substantial sums for shippers, distributors, and retailers of agricultural products are listed in the annual report for 1951 of research activities by the U. S. Department of Agriculture under the Research and Marketing Act of 1946.

Items listed included the following:

A saving to western lettuce growers of $300,000 a year in shipping costs resulting from a new-type shipping crate.

A saving of $440,000 a year in shipping western-grown vegetables as a result of research which reduced the quantity of ice used.

A saving of 25 percent in cost of hauling blackstrap molasses by using tank-trucks instead of barrels.

An estimated saving of $4,000,000 a year in handling produce in the Boston area made possible by use of an improved wholesale produce market facilities plan.

A saving of refrigerator charges amounting to $275,000 a year to cantaloupe growers by using a new method of loading.

The report also showed how more effective pooling of skills and techniques of economists, engineers, chemists, biologists, and other technicians, made possible by the RMA, has solved prepackaging problems for growers; problems of storage and conditioning of grains, seeds, and feeds, and has aided in developing revised standards and grades to improve their serviceability.

Illinois Association Plans Study of Handling Perishable Commodities

FOLLOWING a successful experimental study of corn icing, reported on another page, the Illinois Association of Ice Industries is working on another cooperative activity with the University of Illinois in the field of education and training of handlers, in the improvement of methods for handling perishable commodities, particularly fresh fruits and vegetables. In many cases, it is explained, the efforts expended by growers and handlers in producing perfect merchandise is nullified by the lack of knowledge, methods and facilities at the retail level. It is to provide this knowledge that this study is planned.

The association is working with W. F. Lomasney, extension specialist, Fruit and Vegetable Marketing, Department of Agricultural Economics, University of Illinois, and is now ready to submit the plan to members of the association, asking them to cooperate in their local markets.

Plan is Outlined

The proposed retail marketing and merchandising activity is outlined as follows:

I. RETAIL MARKETING AND MERCHANDISING ACTIVITY WILL CONSIST OF:

1. *General meetings* on produce merchandising to supplement regular educational programs of trade associations, voluntary groups, etc. Topics that can be presented are pricing, quality control, prepackaging.

2. *Merchandising short courses:* A concentrated program for store owners, managers, and clerks as well as wholesale produce salesmen, truck jobbers, and farmers dealing directly with the retail trade at store level.

II. SHORT-COURSE ORGANIZATION INFORMATION:

1. *Length of course.* Eight hours. Meetings will be concentrated into one day or presented in four sessions of two hours each, whichever meets local demand.

2. *Type of course.* Principles of produce merchandising will be stressed. Skills will be included to demonstrate and emphasize the principles presented.

3. *Individual store contact:* a. Callbacks to stores represented at the short course will be made in order to help the grocer employ the principles taught and develop needed skills. b. Periodic meetings will be held for those completing the short course to review subject matter, raise questions, and present newer developments. c. A regular news letter will be sent to all.

4. *Where short courses will be held.* Short courses in retail merchandising will be held in any Illinois city or town where there is sufficient demand.

5. *Sponsorship.* In any community an attempt will be made to integrate the project with existing extension activities of the farm adviser and county office. However, the short courses and other educational meetings will be sponsored primarily by organized trade firms and associations. Sponsors are expected to furnish a meeting place and sufficient produce for demonstration purposes.

6. *Cost.* To help defray costs, there will be a charge of $5.00 to each store enrolling personnel in the short course. *Cost to sponsors* of this program should not exceed $10.00 a meeting.

7. *Enrollment* should be made through the local sponsoring organization on forms provided by the University. Registration for any one short course will, however, be limited to a maximum of 12 people in order that each may receive individual attention and benefits.

8. *Recognition.* Individuals and/or stores whose personnel complete the short course will be awarded certificates of recognition.

III. RETAIL MERCHANDISING OBJECTIVES AND PROGRAM.

The applied principles of marketing can be profitable to producers, distributors, and consumers. Information that meets the needs of retail store operators also benefits other groups in the marketing system. Retailers are constantly seeking to find ways to:

1. Increase sales volume.
2. Attract more store traffic.
3. Reduce stock losses.
4. Meet competition.

The retail marketing and merchandising short course of the University of Illinois Agricultural Extension Service will consider these problems. Using the produce department as a reference, classes will consider:

1. *Consumer demand.* A merchandising program to increase volume will be proposed that is based on what the homemaker has come to expect and want in a retail fresh fruit and vegetable department.

2. *Organizing an effective produce department.* Successful merchandising and promotion are built on planning, coupled with a definite *method* of buying, preparing, displaying, and record-keeping. Seasonal produce supply factors will be considered.

3. *Quality control and pricing.* Seventy-five per cent of all shoppers are quality and price conscious. In consideration of this large market, we will analyze the "how," "why," and "what" of produce retailing losses price" values.

4. *Modern developments in retail merchandising.* Surveying what is new and reviewing what can be done profitably. Discussions will feature personnel problems, what you should be grossing in produce, profit-sharing plans, and marketing efficiency.

Pacific Fruit to Rebuild Old Refrigerator Cars

THE Western Pacific Railroad and Pacific Fruit Express Co. have signed a contract through which 900 refrigerator cars, long retired as a result of normal wear and tear, will be completely reconstructed.

The work will be done in Pacific Fruit Express' Roseville, Cal., shops and will not start until August, because of lack of necessary steel and other materials. All cars will be in service early in 1953.

The contract involves an investment of $7,755,000 by Western Pacific. The 900 cars will be provided with steel frame superstructures, electric air-circulating fans and other modern features required to make them equal in service characteristics to new refrigerator cars.

Ice Company Goes Out of Business

THE Artesian Ice Co., of Fort Madison, Iowa, announced the middle of January that no more ice would be made after the present supply is exhausted, and that the company was going out of the ice business. All real estate property with the exception of the locker plant has been sold to the W. A. Sheaffer Pen Co. which will use the buildings for expansion of its own business. The Artesian Ice Co., was an old and well established concern serving Fort Madison and surrounding towns. It was announced that a Burlington ice company will take over delivery of ice in Fort Madison.

Canadian Refrigerator Production Decreases

CANADA'S production of household mechanical refrigerators declined during the first ten months of 1951, the Bureau of Statistics reported. Imports of refrigerators increased sharply. Output of household electric refrigerators declined to 13,437 units during October, a sharp drop from 34,253 in October, 1950. In the ten month period, 257,196 units were produced compared with 279,177 the previous ten months.

Reports from Unit Ice Associations

Northwest Association Of Ice Industries

L. F. MARSH, Secretary

PLANS for the annual convention of the Northwest Association of Ice Industries to be held at the Chanook Hotel, Yakima, Wash., show every indication that it will be worth while for every ice man in this section.

The program will offer all those who attend something valuable with real dollar savings ideas. In addition there will be entertainment for the ice men and their wives. The Yakima boys say the "Fruit Bowl of the Nation" is going to provide the best convention we ever had.

The convention will open with a social get-together in the hotel Wednesday evening, March 26 at 7:30.

Thursday morning begins the work of helping members get more profit from their business. The call to order will be at 10:00 a.m. sharp and this will be followed by President Davidson with his "President's Address." President Davidson has something to say and all should hear him.

The business of the convention, report of secretary on finances, appointment of committees, etc. will take a few minutes after President Davidson's address then we will hear from our old friend and ice industry friend Tom Gilliam on "What Happened at Houston."

This will be followed by a half hour or more for discussion of the ice industry from a National viewpoint presented by representatives of the National Association of Ice Industries.

The afternoon session Thursday will begin with a "Meat on Ice" program, giving the points on this new development, how we can use it, what to do and what not to do in putting ice into the meat markets of the Northwest. No ice man should miss this. Of course, for those who are swamped with demands for their ice and whose profits are so big that they are supporting most of the government enterprises by individual tax payments, this new outlet for ice may make things even more burdensome, but for most of us it will be very welcome.

After meat has been really put on ice we will have "Vegetable Icing from a Produce Man's Viewpoint." We will learn why, when, how, and where ice can be profitably used in vegetable icing.

The Thursday afternoon program will present new developments in vending machine operation and service as found to be successful by some of our members who have had experience in this phase of the ice business. Three separate discussions of this very interesting subject are planned.

Thursday evening has been planned by the committee so that all members of the convention will be entertained yet will have a chance to have personal contacts with their fellow ice men.

Friday morning the convention will convene again at 9:45, for a discussion of "Retail Delivery and Public Relations" by one of the largest and most successful operators in the Northwest. This will be followed by a talk on sized ice, and then a man whose company has made a specialty of car icing for years will tell about this phase of the business.

A friend and loyal supporter of the ice industry, Tom Gilliam, will talk on "What's Wrong with the Ice Industry and What We Should Do About It." Tom will have something for all of us to think about.

After being told what's wrong with us, we will have another loyal ice industry friend, Gilbert Harris, tell us about reducing the cost of ice making.

The Friday afternoon session will be devoted to merchandising and employee training, and a round table talk on this always brings out ideas that prove most valuable.

Kansas Association Of Ice Industries

THE Kansas Association of Ice Industries is planning to hold four division meetings over the state on poultry icing, meat-on-ice, to help promote the sale of ice in the different markets we now have; and to stir up a new interest in the business. Shanty Shanton will be in charge of these meetings.

Business conditions in our section of the state have given us nothing to complain about. It is average and provided we have a good spring we will have good business this year.

What we need most to worry about, in the opinion of this ice man, is the direction our own government is taking in its over-size budget, and proposed legislation the labor leaders have before Congress. Regarding our foreign policy, we must learn to live in this world with other people and still not dictate to them how to run their government. We must get over the idea that we have to have a war going in order to have prosperity.

Illinois Association Manager's Conference

THE Manager's Conference of the Illinois Association of Ice Industries held at Decatur, Ill., January 31, was well attended and proved very interesting and constructive. Edward G. Shipman and Al Conway of the OPS Office, Springfield, explained government regulations as they apply to the ice industry. They made a very favorable impression, inspiring confidence and creating an atmosphere of cordiality and understanding that will encourage those desiring adjustments in prices, to lay their problems before them. They made a special point of the fact that all applications for price adjustments filed to date in the Springfield office have been approved.

The operating problems of the industry were thoroughly discussed at the "grass roots" level and ideas and experiences were freely exchanged to the mutual benefit of all concerned. Many at the meeting pronounced it one of the best meetings ever held. According to William D. Wright, secretary of the association, there will be more such meetings held during this year and it is hoped and expected that a good attendance will be attracted.

A committee was appointed to arrange the program and entertainment for the annual convention of the association to be held at the Leland Hotel, Springfield, Ill., March 20-21. This committee is already at work. Ideas and suggestions were gathered at the management conference on subjects the members wanted to discuss and the program will be built around this information.

Missouri Spring Meeting

THE annual spring meeting of the Missouri Valley Ice Manufacturers Association will be held Tuesday, March 18, at 9:30 a.m. to 4:00 p.m., at the City Products Corporation showroom, 3638 Olive Street, St. Louis, Mo.

At this meeting a complete demonstration will be given showing the correct procedure for arranging a meat case for the new "Meat on Ice" program. Reports on the Poultry Icing meetings being held in Missouri under the auspices of the University of Missouri Agricultural Extension Service will be given. Other items of interest to all icemen will be included on the agenda for full discussion.

Indiana Association Of Ice Industries

ROBERT W. WALTON, *Exec.-Secy.*

FOR the 57th annual convention the Indiana Association of Ice Industries returns to French Lick Springs, the garden spot of Indiana. Popular demand has moved the 1952 convention from Indianapolis to this beauty spot of Southern Indiana, and all Indiana ice men are looking forward to a reunion at French Lick for three days, April 1, 2 and 3.

Guest from the National Association will be Guy Jacobs, featured speaker at the luncheon, April 2, speaking on "Your National Association." For the most part the program will be devoted to managing and merchandising problems. Thoroughly competent speakers will point out merchandising oportunities and help solve problems which concern management.

The convention will open officially Tuesday noon and after the afternoon session, the annual get-together party will be held followed by a bingo party. An all-day session will be held Wednesday and that evening the annual banquet and floor show will be held. The session on Thursday will open with a breakfast and the convention will adjourn at noon Thursday.

Training Program Opens

Our 1952 training program is now in full swing in Southern Indiana. Attendance and enthusiasm has been high at all these meetings, and it is believed that most worthwhile results will be obtained. Our goal is better understanding of the ice business on the part of all personnel in the industry and improved sales and service. While our program is nearing completion in Southern Indiana there is still time to enroll additional companies in our northern section.

One of the most rapidly growing markets for ice is in the poultry industry. The huge advertising campaigns of such companies as Swift & Company are beginning to show results for ice is becoming recognized as the only satisfactory refrigerant for poultry. This fact automatically opens up a terrific market for poultry cases in food markets, and alert ice companies everywhere are building substantial tonnage around the poultry industry.

Southwestern Ice Manufacturers Association

P. A. WEATHERRED, Secy-Counsel

TO MEET the ever-changing conditions of the industry the officers and directors recognize their responsibility, and realizing the need to work together during these critical times, they have set up for 1952 a program that includes the service of the small but highly efficient and seasoned staff that have served so well for so many years; an office equipped to render individual information, advice and assistance on any question affecting our operations; professional and effective representation before federal and state agencies; a fine convention plus engineering, merchandising and regional conferences; generally an organization through which the association can work effectively in meeting individual and our common problems.

The annual convention of the association will be held at the Hotel Texas, Fort Worth March 12-14. The first business session will be held Thursday morning, March 13 and the convention will close at 1:30 p.m. Friday. Friday afternoon and evening a cocktail party will be held, followed by the annual banquet.

Analysis of the present market, opportunities for new profit from old outlets, encouraging, in fact, exciting developments of new and profitable business, restatement of requirements of modern ice management, all will be topics of discussions led by sound industry leaders whose experience and thinking are respected throughout the ice industry of America. Time for floor discussions of major subjects has been provided for.

The entertainment features will be as fine as the finest anyone ever enjoyed at a Southwestern convention. Madam President's Tea will be both a tea and style show. At the final banquet, music will be supplied by Fletcher Hereford and his nationally famous orchestra. Joan Frank, who has been with us often before, and her great group of entertainers will present as fine a floor show as was ever presented at one of our conventions, and that is saying a great deal indeed.

"Andy" Anderson, Hotel Texas manager, and his Maitre d'Hotel, Chef Hubbard, are going all out to extend at their refurnished, redecorated and reorganized Hotel Texas, the finest room accommodations, the best service, the most excellent menus, and the all around most enjoyable convention holiday that any hotel has ever extended.

Packages for Fresh Produce

STUDIES on packages for fresh produce have been conducted at the U. S. Dept. of Agriculture Plant Industry Station at Beltsville, Md. Preliminary reports are that the package may shut off too much oxygen. A tightly packaged product held at low temperature and then exposed to higher temperature for retail, may spoil faster if not allowed to breathe more. The authors worked with apples, green beans, spinach, tomatoes (pink stage), cauliflower and cole slaw at 50 and 70 F, packaged (perforated and unperforated) in 450 LSAT cellophane and in some cases with Lumarith and Polyethylene.

The first three named commodities seemed to require no perforations and the latter three were apparently benefitted. The authors conclude that ventilation of LSAT cellophane should be recommended as a precautionary measure for these products and (from other studies) for all produce if the film is as resistant to water vapor, oxygen and carbon dioxide as LSAT cellophane. Lumarith gave satisfactory results without perforation, Polyethylene, on the other hand, allows only moderate diffusion of oxygen and carbon dioxide and is resistant to moisture vapor.

Building Ice Plant For Israel Brewery

CONSTRUCTION of an ice plant to form part of the $1,500,000 Israel National Brewery, Ltd., is now proceeding at Nathanya, north of Tel Aviv, according to Louis Hertzberg, president of Metropolis Brewery of New Jersey and chairman of Old Dutch Brewery South Africa, Ltd.

Mr. Hertzberg, who is establishing the new brewery in Israel with a group of other Americans and Palestine investors, has just returned from a trip to Israel, where he presided at the laying of the brewery cornerstone.

Poultry Icing in Missouri

A SERIES of poultry icing demonstrations for grocers and butchers in Missouri are being conducted by Ted Joule, Extension Economist in Marketing, University of Missouri. The meetings will be held in all sections of the state during 1952. The association has purchased a 5-foot poultry display case for use at these meetings. Programs were conducted in Springfield, Sedalia and Jefferson City during January, and in Mexico, Kirksville and Moberly during February.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

Alvis Clay, Memphis, Tenn.
First Vice-president
National Association of
Practical Refrigerating Engineers

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Factors That Result in Poor Refrigeration Plant Operation

C. T. BAKER
Consulting Engineer

Through case histories the author of this article stresses the need for more intelligent attention to plant maintenance and proper engineering. There are plants now operating that will be closed within five years, and there are others already closed, he says, because they were the victims of unretarded depreciation and obsolesence.

IN discussing the subject "Factors that Result in Poor Refrigerating Plant Operation," the speaker feels that, perhaps, the most effective and direct method is to present various case histories of ice and refrigerating plants that he has investigated over a period of many years. Most of these plants were in bad physical condition, which has resulted in high power and maintenance costs and, in many instances, excessive labor costs. They are all bona fide histories and can be verified by examination of my files.

To many of you, particularly those who are meticulous about the proper maintenance of their plants and who know at all times what production costs are, including, of course, power costs, these stories may seem farfetched, but it should be borne in mind that not all plant engineers by any means, follow the rigid rules of operation and maintenance prescribed by the members of this organization.

Poor Operation Not Confined to South

The conditions I shall describe existed in plants scattered throughout the country. Time was, when it was popular to say that most of the inefficiently operated ice and cold storage plants were confined to the area below the Mason and Dixon Line and that the country above was practically free of faults. However, my practice as a consultant in both refrigerating and power plant engineering has involved activities on both sides of the historical line, which enables me to testify that by no means are all the poorly operated properties located in the South.

One plant I investigated was in a middle-western city. It had an abundance of condensing water at a temperature of about 58 F, taken from a deep well on the premises. You will be interested to learn that in this particular plant, the condensing pressures carried were between 185 and 190 pounds.

I am sure you will agree that maintenance is the most important department of all plant operations. Second in order I would name accurate records, including plant logs that reflect exactly the essential operating details, with daily notations of the power consumed, the power cost per ton of output and the quantity of refrigeration produced. As the case histories related are directly associated with plant maintenance and operating records, it seems appropriate to emphasize these factors at the outset. Because of time limitations, only the high points will be cited, but I shall try to include sufficient data to indicate the principal causes of unsatisfactory performance records and to suggest to those of you who may be facing problems of the same character, a means of escape. The cases were chosen at random from my files and they cover both large and small plants.

Presented at the 42nd Annual NAPRE Convention.

Case No. 1

This is a small plant. It was sold as a ten-ton daily ice-making unit. It made capacity, but at a power cost out of all proportion to what one would expect, even in a ten-ton plant, as the power cost figures show. For the first quarter of the annual figures examined, January through March, the cost of electric power was $3.25 per ton of ice produced, and for the whole year the cost averaged $2.10 per ton.

As is frequently the case, the conditions responsible for these abnormally high power costs were high condensing pressures resulting from dirty condensers, non-condensible gases, and a deficiency in condenser capacity. Condensing pressures during the summer months averaged 205 to 215 pounds gauge, notwithstanding that there was an abundance of 70F condensing water.

This plant, as a whole, was in bad physical condition because of neglect of the owners to properly maintain the equipment, and the end of this story is their 'obituary.' The owners went broke and the plant was sold under the hammer. However, the community is now served by a modern plant with facilities for refrigerated storage and a good quality of ice. Upon looking in on the new development recently, while driving through the town, I noticed that the condensing pressure gauge read 135 pounds and the suction pressure, 25 pounds. Housekeeping methods were excellent and business appeared to be good. The ice-making capacity of this new plant is twenty-five tons and I learned that the cost of power chargeable to ice production averages 75 cents per ton.

Case No. 2

This small plant used oil engine power. They purchased their oil locally and paid 13½ cents a gallon. Their capacity for storage at the plant consisted of one 120-gallon tank. Their records disclosed a poor showing for an oil engine drive, as their cost per ton of ice was $1.48½ and they used 11 gallons of oil to produce a ton of ice. Two things were needed to bring these costs down. One, the installation of a large storage tank, and the other, a complete engine overhaul. By the installation of a tank with a storage capacity of two tank cars of oil, and the continued use of their old tank, the plant operators were able to purchase their fuel in tank car lots at a cost of only 7 cents a gallon. This was a reduction of 6½ cents a gallon below the small quantity price.

In turn, the complete overhaul of the oil engine reduced the fuel consumption from 11 to 7 gallons per ton of ice produced. This represents a saving of a little more than a dollar per ton in fuel costs.

Case No. 3

Experience has convinced me that too often proper attention is not given to the question of power circuits serving the motors of ice and refrigerating plants. It is not at all unusual to find these circuits entirely too small for the current they are required to carry, with the result that there is a decided voltage drop at the motor terminals. This materially reduces motor efficiency and increases power costs.

A case of this character came up some time ago. A modern fifty-ton ice plant was installed by a man who was considered to be proficient in this field, as he had had many years of experience in operating and managing ice plant properties. However, soon after getting into production, he complained that his power costs were excessive and that he was looking for ways to reduce them to an amount comparable to that which his competitor expended. My investigation disclosed a very serious condition—voltage drop.

With the plant operating at full capacity and with all motors connected to the system in operation, a check at the entrance switch to which the power service was connected, showed the voltage to be quite satisfactory. In fact, it was about 225 volts, which is desirable from the standpoint of reducing losses in the distribution system. However, measured at the terminals of a 125 hp motor, the voltage was 204—16 volts below that for which the motor was wound. A further check of the motors throughout the plant showed substantially the same drop everywhere.

In going over the wiring system, I found that in each case the circuits were from one to two gauge sizes smaller than were actually required to operate such motors without voltage drop. In a discussion later with the owner, he admitted that he had accepted the low bid offered on the electrical work and that no specifications had been prepared covering the job. He didn't know what size circuits the contractor intended to install and had no knowledge of what was in the mind of the contractor when he submitted his proposal.

The cost of replacing all of this wiring was prohibitive, so the owner felt that there was nothing left but to make the best of a bad situation and continue to let the power company have a considerable portion of his gross profit. This case is typical of numerous instances of high power costs which I have investigated.

Case No. 4

A plant rated at 100-tons capacity, another suffered from high power cost, requested an investigation. A number of things detrimental to the economical conduct of an ice plant were found; some were the usual, run-of-the-mill variety and others were of a more serious nature, but all were corrected. A good purger had been installed in this plant, but was never used. A reply to my question about it brought out the opinion "It just ain't no good!" This was proven false after the purger was properly connected to the system. Its operation reduced the condensing pressure 18 to 20 pounds.

We installed an oil reclaimer to which the oil drains of the three ice tanks and the three high pressure oil traps were connected. In one afternoon the take from the three freezing tanks was 125 gallons of lubricating oil. This arrangement permitted for the first time in the history of the plant a complete blowing out and cleaning of the high pressure oil traps. The recovered oil was reconditioned for re-use and materially reduced the cost of lubricating the various compressors.

However, the most interesting phase of this investigation was can submergence. When the brine had been sufficiently strengthened to prevent frost formation on the coils, the cans would float, rising to an extent sufficient to bring the water level well above the brine level. This greatly increased the time required to "close in" or freeze the top end of the block. A "rabbet" strip properly fitted to the underneath side of the can lids, added sufficient weight to keep the cans from floating and completely corrected the trouble.

Location of Water Storage Tank

Still another interesting thing about this plant was the location of the can water storage tank. It had been placed in a spot where about one-half its area was exposed to the sun and a surrounding air temperature of 90 F. while on its shaded side the temperature was only 78 F. This tank was 7 ft. in diameter by 15 ft. 6 in. inside measurement. It was made of wood staves 2½ inches thick, held in place by twelve steel hoops, 3 inches wide x 3/16 inch thick. On the sunny side

of the tank these steel bands reached the temperature of 100 F.

To stop the absorption of the sun's rays, we provided a complete sun break for this tank. After its sides had warmed uniformly to the surrounding air temperature and the black bands had absorbed sufficient heat to raise their temperature to 100 F or more, the water within the uninsulated tank began to get the benefit of considerable of this heat energy. At first glance, this may appear to be of little consequence, but a rise of two degrees in the temperature of the water in such a storage tank in a one-hundred-ton plant is quite an item—about 1.3 tons of refrigeration, including core pulling.

Case No. 5

A very large combined ice making and cold storage plant which the writer investigated some years ago brought to light several wasteful practices which when corrected, effected a decided reduction in power cost while at the same time resulting in greater output. I find that even today, some plant managers and engineers still follow the wasteful methods as referred to in the preceeding paragraph.

I will not tire you with numerous details of this situation but will cite a few of the main causes that prevented maximum operating efficiency. Example—All cold storage rooms were carried at 33 to 34 F and the ice tanks at 15 to 16 F depending upon the rate of pull. Since the four freezing tanks totaling a combined capacity of 125 to 130 tons daily capacity were equipped with coils placed between the rows of cans, it was necessary to carry a suction pressure that would represent an evaporating temperature of 10 to 12 degrees below the brine temperature. This, it was found, called for a suction pressure of 20 pounds gauge during the period when full tank capacity was required.

On the other hand, cold storage temperatures of 33 to 34 F do not require the same evaporating temperature as did the freezing tanks and after checking the gross cooling load and the direct expansion piping in the rooms it was quite evident that a suction pressure of 35 to 36 pounds gauge would have been correct as the evaporating pressure for all rooms yet the entire plant, rooms and freezing tanks, were operated at 20 pounds suction pressure.

A revamping of the main suction lines to permit the two different types of loads to be carried at the most economical suction pressure with an emergency cross connection between the high and low suction pressure mains soon proved the advantages of the higher suction pressure for the storage rooms. This was reflected in a sizeable reduction in total machine operating hours and a reduction in the monthly power bill of about 12 percent. An improvement in pressure loss between the freezing tanks and compressors was effected by increasing the size of the suction pipe one inch.

As, so the engineer said, the 30 foot long section of this suction line was reduced as they had the smaller pipe on hand and wanted to use it until some later date when the larger pipe would be delivered. The pipe was delivered but not used. A gauge reading taken at the two ends of this section of smaller pipe show a pressure loss of three pounds when the tanks were operating at full capacity. No operating records of any kind were kept by the plant engineers and no one knew other than by general indications what was taking place. Some idea of the amount of power required for this operation may be had from the fact that the total connected load in motors and lights was a little over 700 hp.

Looking over a copy of the report by this writer covering the engineering talent of this plant, I find the following comment.

"I was particularly impressed with the lack of knowledge of operating details on the part of the chief engineer and some of his assistants. It is plainly evident that their methods were entirely "rule of thumb" and empirical, that guess-work prevails and that they have only a dim knowledge of cause and effect gained by several years association with the industry.

"The chief engineer is affected by an ingrown ego and seems to think that he is more or less the sole depository of engineering knowledge. Operating details are being neglected to such an extent that nothing like the possible efficiency of this plant is being maintained.

"No records of condensing temperatures or machine hours of operation are kept, and the whole atmosphere gives one the impression of a "don't give a damn spirit."

Case No. 6
The Story of the Pumps

A plant I investigated some time ago, disclosed an interesting pumping situation. Plenty of condensing water was available at this plant, but, of course, it had to be pumped through the condensers. The first condensing water pump to be installed was rated at 500 gpm, designed for a total head of 95 feet and was driven by a 20 hp motor. Some time later, when it became evident that more condensing water was needed, a second 500 gpm pump was purchased. When the new pump was installed it was connected to the existing suction and discharge line which had barely sufficient area for one pump. However, it seems that, in order to insure complete failure to perform, on the part of the second unit, this pump was designed to deliver 500 gpm at 40 foot head and was direct connected to a 10 hp motor.

You may find it difficult to believe that anyone with even a smattering of knowledge of hydraulics, would install two pumps of greatly dissimilar pumping heads, but it actually happened and the writer has the proof.

Case No. 7

A 30-ton ice plant, operating on purchased power at an average cost of 1½ cents per kwh (including the demand charge) was another victim of high power costs. A cooling tower cooled the condensing water for reuse. Since for most of the year, the bulk of the heat dissipated by the tower results from evaporative cooling, it is important that any type of cooling tower be favorably located insofar as air movement is concerned.

In the case under discussion, the tower for this plant was placed on the ground between two old frame storage buildings, both of which were much longer and a good deal higher than the tower. The result of this was high condensing pressures during the entire ice season, caused by failure of the tower to properly cool the water. A better part of the time, the relative humidity of the air around the tower was well over 90 percent. Obviously, very little evaporation could take place under such conditions and consequently comparatively no cooling was done, so the condensers had to be satisfied with warm, rather than cold, condensing water.

It is a curious commentary on the nature of human beings, that after more than half a century of cooling tower operations in the United States, it is still necessary to caution people long engaged in the ice and refrigerating field, that cooling towers, to function efficiently, must be so located as to permit free and easy air circulation around the entire structure and that there must also be sufficient stack effect to carry away the water vapors resulting from evaporation. It seems that there are still a good number in the industry who

have only a dim notion of the how and why of cooling towers and the principles of their operation.

Cooling Towers

The selection and installation of cooling towers is governed by certain factors that must be correctly evaluated if success in operation is to be achieved. They may be briefly stated as follows:

First: Determine the maximum number of gallons of water per minute that should be circulated through the condensers and water jackets.

Second: Decide upon the type of tower—atmospheric, forced draft, induced draft, or atmospheric spray tower.

Third: Furnish the tower manufacturer complete data on prevailing wet and dry bulb temperatures; average and minimum wind velocities; and intended location of the tower with reference to other structures.

It seems appropriate to add a few general suggestions regarding the selection of a cooling tower.

First, keep in mind that it seldom pays to specify a run-off water temperature closer than five degrees to the design wet bulb temperature. To insist upon a closer approach than this will call for an expenditure greatly in excess of that justified by any possible theoretical improvement in plant operating efficiency.

For the usual ice or cold storage plant, a wet bulb temperature of 78 F is generally selected as the design wet bulb temperature. Now, if we have a leaving water temperature approach of 5 degrees to the wet bulb, the water entering the condensers will be 83 degrees, which is not at all bad for cooling tower operation.

By pumping sufficient water to hold the temperature rise through the condensers to 89 degrees, which requires 5 gpm per ton of refrigeration, we can expect the condensing pressure to fall somewhere between 180 and 185 pounds per square inch gauge, providing, of course, that the system is maintained free of air and that the water surfaces of the condensers are kept free of accumulations of scale, algae etc.

In deciding upon the amount of water per unit of time to circulate through the tower and through the condensers, it will simplify matters to translate the entire plant output into tons of refrigeration. The modern ice producing plant will reject a gross of about 250 Btu per ton of refrigeration per minute, of which about 50 Btu represents the heat of compression. A 100-ton refrigerating plant, using five gallons of water per minute, per ton of refrigeration, rejecting 250 Btu per minute, per ton of refrigeration, would have a temperature range of:

$$\frac{100 \times 250}{8.33 \times 5 \times 100} = 6 \text{ degree range.}$$

In selecting cooling towers for refrigeration plant service, a number of things should be considered. For instance, in the case of forced draft towers, overall height, air velocities through the structure and water rates per square foot of effective tower area are factors that should be given attention. Air velocities through forced draft towers will depend largely upon the design selected. Usually, velocities of from 350 to 400 feet per minute are considered normal. The short forced draft tower introduced a few years ago, has permitted higher velocities and shorter air travel than were possible with the earlier type tower. This has resulted in reduced saturation of the leaving air, but the disadvantage is offset by the fact that larger air volumes with less draft loss are possible.

The author of this article emphasizes the need for intelligent attention to plant maintenance. Many plants now in operation will be out of commission within five years unless the owners begin to improve their mechanical efficiency, he says.

As a general practice, represented by today's design, the water rate per square foot of effective tower area is 4 to 4.5 gpm for the larger towers and 2.75 to 3.25 for the smaller.

Reverting to the question why the performance of cooling towers installed in many ice and refrigerating plants is unsatisfactory, it is usually the fault of the owner, and failure stems from the fact that the tower is erected in an unsuitable location or the owner has selected a tower with insufficient cooling capacity. Prevailing wet bulb temperatures and average wind velocities not taken into consideration before the installation, often defeat the operation of well built and well designed towers, particularly those known as the atmospheric type.

One type of tower widely used in ice-making plants is known as the atmospheric spray type. They have proven highly successful in service and require very little attention. Yet, there are those who claim that they do not find them satisfactory. Usually, there are reasons for the alleged failures. For example, in one case investigated by the speaker, three different makes of spray nozzles were found installed on the tower, each designed for a different nozzle inlet pressure.

Another case disclosed that the condensing water pump which had formerly been used successfully on a low, homemade atmospheric tower, could not develop the pumping head required to produce the proper spraying over the new spray type tower, which had resulted in insufficient cooling of the condensing water. Pipe, of a size too small, will prevent cooling towers of all types from performing satisfactorily. Some engineer, in this case, had reduced the diameter of the pump suction and discharge lines below that dictated by good engineering practice, in order to save on first cost. This is absolutely wrong and should not be permitted under any circumstances.

The fact that the elevation of the cooling tower above the pump affords a positive pressure at the suction inlet of the pump does not mean that no pressure loss will occur in the suction line between the tower basin and the pump. Loss in head, due to friction in pipe and fittings, as shown by the friction tables in a pump catalogue, is just as real as the friction losses in the pump discharge line. It follows that if the cooling tower and condensers are to receive the quantity of water needed to meet the requirements of any given situation, the water piping system must be properly laid out and based on sound principles. Consult pipe and fitting friction tables before selecting the size pipe to use in installing condensing water piping systems and cooling towers. Such precautions are important whether or not cooling towers are involved, but are vital when cooling towers are a part of the system.

Case No. 8

Not all the trouble in the field of refrigeration is confined to ice plants and their associated cold storage rooms. In support of this, suppose we examine an alleged "strictly up-to-date freezer locker plant."

I made a survey of such a plant about two years ago. This was a Freon-12 installation. It was supposed to be a fully automatic plant, with the compressors sized to handle the load in sixteen hours daily running time. Actually, none of the total of six compressors ever stopped—they operated around the clock—there was no defrosting time. The power

cost was terriffic and the management wished that freezer locker plants had never been thought of.

It developed that most of the high power cost was the result of low evaporating pressures and excessive heat leakage, due to too little insulation, resulting from the desire on the part of the owners to save on first cost. Six inches of cork insulation had been used on the roof slab, with the built-up black surface roofing material laid directly on top of the cork. This was the construction over the zero temperature storage rooms and the minus twenty degrees freezer room. The same was the case over the high temperature storage rooms, with the exception that only a four inch thickness of corkboard had been used.

The suction pressure carried in the evaporators in the zero storage rooms was 11 in. vacuum, corresponding to minus 40 F evaporating temperature, while the evaporating pressure carried in the evaporators in the 35 degree storage rooms was 9 in. vacuum, corresponding to a temperature of minus 35 F. In one case the evaporating temperature of the Freon 12 was 40 degrees below room temperature, while in the other, the difference amounted to 70 degrees. The suction pressure of the high temperature compressor could easily have been held at twenty-one pounds. The difference in the refrigerating capacity of a Freon compressor operating at twenty-one pounds suction pressure, against nine inches of vacuum is 65 percent.

This situation was cleared up by adding four inches of sheet cork to the entire roof area, replacement of defective wall insulation and providing suitable defrosting equipment for the various unit coolers.

Conclusions

I could continue indefinitely, giving examples of causes of failure of many plants to produce ice and refrigeration at reasonable cost, leaving a little money in the bank for the owner's old age, but my many years of investigation of sick plants and prescribing remedies, have taught me that they all fall into the same general pattern—one example serves innumerable cases. So, there would be little, if anything, gained by perpetuating the discussion.

I do wish, however, to place emphasis on the need for more intelligent attention to plant maintenance. I can testify to the fact that there are several plants I know of that will not be in operation five years from now unless the owners begin at once to put their houses in order. I have personal knowledge of at least four that have closed their doors in the last few years because they were the victims of unretarded depreciation and obsolescence.

N A P R E Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating problems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Booster Added

Question No. 910: We are adding about 27 tons refrigeration at –28 F evaporator temperature to our plant load. I assume this added load should be carried on a booster compressor. At present we have two ammonia compressors in operation: a 10x10 at 280 rpm and an 8x8 at 300 rpm. They operate at about 20 psig suction and 175 psig discharge during periods of maximum demand and we figure the load they carry is about 65 tons refrigeration.

Can these two second stage compressors carry the added booster load mentioned above?—G.A.R.

ANSWER: Evidently there is something radically wrong about the statement of this problem. Either the combined capacity of these two compressors is much greater than 165 tons or the suction pressure is actually much less than 20 psig or the compressors are in bad shape. At 165 tons capacity the suction pressure should be not higher than 12 psig, and at 20 psig the capacity should be not less than 189 tons. Of course I realize that it is impossible to determine the actual load on a refrigeration plant without means of metering the flow of liquid ammonia. For that reason we are obliged to take the manufacturer's ratings of compressors at various suction and discharge pressures. And these ratings are valid only when the compressor valves and rings are in excellent working order, and the clearance is okay.

If your suction gage is correct and your compressors are in good working order, I am safe in stating that your present capacity is very close to 189 tons instead of 165 when operating at 20 psig and 175 psig. In this event the addition of the 27 tons refrigeration load from a booster compressor will raise the suction pressure from 20 psig to about 31 psig. If on the other hand a load of 165 tons is carried on 12 psig suction pressure as it should be, the addition of the 27 tons booster load will result in a suction pressure of 21.5 psig.

The ratings of the two compressors were based on the A.C.R.M.A.* tables published on page 81 of Refrigeration Theory and Applications. York and Frick tables would give slightly higher tonnages than those obtained from the A.C.R.M.A. tables—H. G. Venemann.

*Note: Air Conditioning & Refrigerating Machinery Association.

Leak Warning for Brine Cooler

Question No. 911: We recently had a leak in one of our shell and tube brine coolers. They cool the brine to about –20 F with the ammonia suction pressure at about 3 inch vacuum. The leak thus allowed the calcium brine to be drawn into the ammonia system.

How could we arrange the system so that a leak would be quickly discovered before any troublesome amount of brine is drawn into the ammonia system? There is quite a large quantity of brine in this system which circulates from the coolers in the basement through refrigeration coils on a number of floors above. For this reason I do not believe a low level alarm on the brine in the balance tank on the roof would be practical. Your opinion on this point, too, would be appreciated.—C.T.S.

ANSWER: I do not know of any device which will automatically indicate an ammonia leak into either brine or water. I cannot see how a low-level alarm on the brine in the balance tank would indicate an ammonia leak. I suggest that you test the brine at regular intervals with Nessler's reagent. It will indicate minute quantities of ammonia in the brine, one part per million. When using this reagent with calcium chloride brine the brine must first be treated in the following manner:

Dilute one ounce of the calcium chloride brine with four ounces of water and add a sufficient quantity of concentrated solution of pure sodium carbonate to precipitate all of the calcium chloride. Then filter and test with a few drops of Nessler's solution. If the solution turns brown, ammonia was present in the original solution. Nessler's reagent may be secured at the drug store.—H. G. Venemann.

N.A.P.R.E. Department

Condenser Leaks

Question No. 912: A leak in a condenser which allows the refrigerant to go into the cooling water would eventually be indicated by a shortage of refrigerant in the receiver. In a relatively simple system where the evaporator is close to the condenser and compressor and the load is rather steady, the liquid receiver level would probably be a satisfactory indicator of the tightness of the system.

In many plants the liquid level in the receiver varies from time to time so that this liquid level does not appear to me to be a sufficiently positive indicator of a refrigerant leak. By what other means would it be possible to keep track of conditions and obtain rather quick warning when a leak develops in the condenser and releases refrigerant into the cooling water.—C.T.S.

ANSWER: I agree that the liquid level in a receiver is not a particularly good indicator of a refrigerant leak. It might tell that the refrigerant supply was low, but it would not tell where the refrigerant was escaping. In the case of ammonia any leak into the air may easily be detected either by test paper or by burning sulphur. A leak into the condenser, if large, may be detected by test paper and, if small, it may be detected by Nessler's reagent.

I suggest that if one desires to check an ammonia condenser or water jacket for leak that he make the test after the compressor has been shut down and the water cut off for several hours. This will give a higher concentration of the ammonia in the water which may easily be detected by test paper. I am not familiar with practical methods of detecting Freon leaks except by means of the halide torch. I would think that the water in a water-cooled condenser would have to be drained off before testing with the halide torch.—H. G. Venemann.

New Questions

Noisy Check Valve

Question No. 913: We have installed automatic control on a 7½ x 7½ compressor that takes care of a locker room and an ice cream hardening room. The compressor is driven at about 200 rpm by a 25 hp motor. The compressor has ring plate valves and must be unloaded to start. We installed a check valve in the 2 in. discharge line, the valve being in a horizontal line about three feet from the compressor. The compressor discharges into a 3 in. line and another compressor that runs on the ice tank discharges into the same 3 in. line about twenty feet from the first compressor.

When both compressors operate, the check valve seems to do quite a bit of chattering, it makes considerable noise. The engineers of the company that sold us the valve say that all check valves make more or less noise and that the valve will stand up. It seems to me that the valve would soon hammer itself to pieces. When the compressor on the ice tanks is off, the valve is pretty quiet. I placed a gage in the discharge line between the compressor and the check valve and the hand fluctuated about 10 lbs between strokes of the pistons. One person stated that a bull check would be more satisfactory. What do you think about it? We are using a solenoid valve in a line from the discharge to the suction side operated by a time relay, to unload the compressor.—J.N.

Water Flow Through Condensing Units

Question No. 914: Sometime ago I installed a self-contained condensing unit using a water cooled condenser on an ammonia system. I hooked the water up to go through the condenser first then through the machine-cooling head. Recently the condenser needed retubing and the engineer doing it said the water was hooked up wrong. Who is right in this case? Will the scale form on the cooling head less readily by having the water go through the condenser first or by having the cold water enter the head first? This machine has a pressure operated water valve so the water would be heated some before leaving the machine head even if the cold water were introduced there. The water forms a hard scale at this plant. —T.C.

Insulation Problems

Question No. 915: Recently in Singapore I came across some peculiar insulation problems and would like to have some practical recommendations for their remedy. As you know, Singapore is situated near the equator and also surrounded by sea. The relative humidity of this place is very high and may be anything up to 70 or 80 percent sometimes.

A few days ago I was called upon a ship and found that surrounding the cold storage door, lots of moisture has condensed. By some strange similarity I found that our new G.E.C. refrigerator (manufactured in England) is also giving the same trouble. When this happened, the relative humidity was very high, as it had been raining continuously for three or four days. The insulation in the ship cold storage room was mainly of fibre glass of about 8 inch thickness and in the G.E.C. refrigerator, I presume, ¾ inch thickness of cork. After the rain stopped and the relative humidity had decreased, all was normal. I must state that these troubles are not universal with all refrigerators and cold stores. What do you think is the best remedy to get rid of these temporary troubles which never exceed more than four or five days at a stretch? P. K. Sarkar, Mem. NAPRE. Box 669, Singapore, Malaya.

News Notes and Chapter Activities

Stockton-Modesto

R. M. EDGER

THE first meeting of the year was held at Stockton. We welcomed Guy Vancleave of The ATSF Ice Plant, Stockton to membership. Mr. Vancleave is the new plant manager, taking the place of W. R. Greenstreet's place who is being transferred to the Bakersfield ice plant. Our meeting got off to a fine start and we had a very good turnout. A nominating committee was appointed and the newly elected officers will be reported in the next issue.

We visited The Union Ice Company Plant No. 18. This plant has been completely renovated into a very modern cold storage plant with cement floors for the lift trucks, new type roller doors, large runways and less posts to interfere with storing the products. All in all it is a fine remodeling job.

Tacoma

ELMER JOHNSON

AT OUR last meeting the same officers who served during 1951 were elected for the current year, as follows:

President, L. E. Haase

Vice-president, Clarence Mase

Secretary-treasurer, C. W. E. Johnson

Educational Chairman, J. A. Slater

Membership Chairman, W. D. Vanderflute

Social, E. D. Branscomb

The educational program has been confined to the study of the new Refrigeration Course under the direction of Al Slater, chairman of the Educational Committee. This course is creating great interest among the membership. Members were invited to bring a friend to the next meeting so that he too can enjoy the educational benefits.

Los Angeles

FRED HERR

A FIELD trip to the University of California at Los Angeles to inspect and see in operation the famous UCLA cyclotron was the program on the agenda of Los Angeles Chapter, NAPRE, for the night of February 6.

This trip was one of a number of tours of industrial, refrigeration and scientific establishments which Regis Gubser of the California Consumers Corp., chairman of the educational committee, has incorporated into the 1952 educational series to provide a variation from the regular business and technical sessions held semi-monthly in the Terminal Club.

A total of 130 members and guests turned up at the university (eventually) to be guided through the Physics Building and into Room 123, which houses the impressive atom smashing cyclotron. The word "ultimately" in the foregoing sentence is used advisedly, for some of the good members of California Chapter No. 2 had themselves quite a time locating the meeting place.

Secretary Donald Byl had accommodatingly included in the announcement not only a map of the streets leading to the university, but also a detailed diagram of the driveways that wind through the spacious campus to the Physics Building. However, the Westwood District of Los Angeles is an area of winding and serpentining roads that are apt to lead anyone astray, especially at night.

Donald's map was extremely well drawn and there is no modicum of truth to the rumors circulated facetiously by some members that posses were still out a week later looking for NAPRE members who got lost in the maze of streets trying to find the Cyclotron Laboratory. There is also no truth to the rumor that Donald himself got lost trying to follow his own map. One wag circulated the report that President Edgar M. Marrs was on the verge of sending out St. Bernard dogs, with casks of ammonia around their necks, to search out several NAPRE'rs allegedly stranded in Beverly Glen Canyon, north of the university.

The evening proved to be an interesting and educational one for the NAPRE members and their many guests. Steven Plunkett, principal electronics technician in charge of the cyclotron, explained the history, theory and operating procedure of the atom smasher. The unit now at UCLA was originally installed at the University of California at Berkeley, and was moved to Los Angeles when the main university acquired a larger instrument. NAPRE members were, however, denied the intriguing spectacle of seeing the cyclotron in actual operation. Mr. Plunkett explained that the total vacuum necessary to operation could not be developed that night.

The visit had an added measure of interest to the members in that Herbert N. Royden III, son of H. N. Royden of the Royden Ice Company, assisted Mr. Plunkett in demonstrating the cyclotron. Young Royden is a physics student at the university.

The usual NAPRE business session was skipped on February 6 to permit the members to take full advantage of the rare opportunity of inspecting the cyclotron.

Secretary Byl, however, advised ICE AND REFRIGERATION that the membership drive is proceeding with vigor. A number of new applications, he reported, are ready to be presented for processing at the next meeting by Membership Chairman W. R. Burnett, who is determined to put Los Angeles Chapter back at the top of the ladder in the 1952 drive.

The report of the recent passing away of Emerson A. Brandt, national secretary, was received with deepfelt sorrow by members of Los Angeles Chapter, many of whom recalled incidences of Emerson's visit to Los Angeles last year.

The educational section of the February 20 meeting was to be featured by a talk on high speed compressors by Ralph E. Manns, head of the Ralph E. Manns Company, Wilmington, Calif.

Treasurer E. T. Quinn, chairman of the Membership Index Committee, reports that the 1952 issue was ready to go to press about March 1.

Memphis

CHARLES CONLEY

AT OUR first meeting in February the chapter's instructor, H. L. Todd lectured on Section No. 1 of the Refrigeration Course. He used the blackboard to illustrate his talk. He also had some pressure gages on display so the members could see how they were constructed and how they operate. From the turnout at the meetings great interest is being manifested in this new course and it is going over big.

Recently we welcomed the following new members: Paul V. Madison, Jr. assistant engineer Q O Chemical Co.; Richard F. Bauer, assistant engineer, Memphis Packing Co., Joe M. Davis, asst. eng. F. M. Stamper Co., and William J. McCoy, Jr. consulting engineer.

The following resolution was introduced and it was suggested that it be included in the minutes of the meeting and that a copy of it, suitably inscribed be transmitted to Mrs. Emerson Brandt. It was also requested that it be published in the NAPRE section of ICE AND REFRIGERATION.

Resolution

Whereas—The Supreme Chief Engineer of the Universe has seen fit to call into his service, in that mysterious place of abode beyond this earthly realm, one near the heart of our organization; Mr. Emerson Brandt, loyal husband and life partner of our admired Mrs. Emerson Brandt.

Be It Resolved—That the members of Tennessee Chapter No. 1, of the N.A.P.R.E., join our respected Mrs. Brandt in bowing to the orders of the Great and Supreme Chief Engineer of the Universe, and accepting, with the good grace of true engineers, that extreme loss to Mrs. Brandt and the Chapter. That in life we knew Mr. Emerson Brandt as a loyal and true friend of the Tennessee Chapter No. 1, of the N.A.P.R.E., ready and anxious to serve our organization without restraint or reservation. He is greatly respected and admired by reason of his gracious sincerity.

Further—to Mrs. Emerson Brandt and members of her family we do in all sincerity and humility offer our profound sympathy and heartfelt condolences in their great loss, in this the darkest hour of their family life. To this sorely troubled family may we be permitted to repeat the simple truth; that the task of parting with one so dearly beloved holds forth the extreme pleasure of reuniting in that perfect existence to come. By preceding us we know that a gracious Mr. Brandt will surely be on hand to welcome us with a smile when our orders are handed down in turn.

Be It Ordered—That this resolution be spread upon the minutes of the meeting. That a copy of same, suitably inscribed, be transmitted to Mrs. Emerson Brandt. Finally that same be duly published in the official Organ of the N.A.P.R.E.

Resolution Committee
ALVIS J. CLAY
B. E. SMITHERS
CHAS. A. CONLEY

Chicago

W. L. TIFFIN

THE first February meeting was held in the Chicago Engineers' Club and was called to order by President Ed Garnaas. A. R. Carlson told about tentative plans that were being made for an Emerson Brandt Memorial Trophy. This trophy would be awarded to the chapter receiving the most new members during the year. It was mentioned that Chicago Chapter would like to make a contribution to help obtain such a trophy. Mr. Carlson also brought up the question of securing additional advertisers in the Operating Data Book. Doug Benton was appointed chairman of an all member committee for conducting a canvass of the manufacturers in this area.

The educational program covered expansion valves and this was conducted by Doug Benton in cooperation with Richard Meyer of Alco Valve Co. Mr. Meyer showed a number of colored slides illustrating thermostatic expansion valves, equalizing lines, proper location of temperature bulbs, and also gave several samples of selecting the proper size expansion valve for a particular job.

Pittsburgh

OTTO P. KNOCH

RECENTLY we had a Board of Directors meeting and it was their recommendation that the present officers remain in office for the ensuing year. They are as follows:

President, James Gallina
First Vice-president, Eugene Luitz
Second Vice-president, James Reiter
Secretary-treasurer Otto Knoch
Sergeant-at-Arms, Alois Paulmeir

The board also recommended that we continue with just the one meeting a month as we have found it possible to get through the full section of the course. The secretary made his annual report to the chapter.

N.A.P.R.E. Department

At the following meeting the chapter voted to accept the recommendations of the Board of Directors. We devote about a half hour to business before we start the Refrigeration Course. We have very capable men who are participating in this Refrigeration Course and it is getting more and more interesting.

Seattle

JAMES R. BENNETT

OUR two regular meetings for the month of February were held on the second and fourth Thursday, as usual at the YMCA. The following officers were elected to lead our chapter during 1952:

President, Joseph H. Lester
First Vice-president, Fred Cornford
Second Vice-president, Chester Bertus
Secretary-treasurer, James R. Bennett
Trustee, Frank Wilson

The chapter unanimously voted to pay the 1953 dues of the member bringing in the most new members during 1952. Our instructors in the educational program took over after the business meeting and covered the sections of Guy King's course on expansion valves and finished up through page 79, starting on thermal expansion valves. The meetings have been well attended, with our membership increasing all the time. We have taken in 23 new members during the latter months of 1951. At the last meeting we welcomed George E. Kearney to membership. He is chief engineer of the M. V. Reefer King.

Dallas

F. W. CUNNINGHAM

OUR members are showing great enthusiasm and interest and our meetings have been very well attended. Being Texans we must brag a little and say that we think we have had some of the best instructors and lecturers to explain and instruct us in our lessons that are to be found anywhere. Not only have we studied and discussed our lessons but we have also brought personal individual problems for chapter discussion to help us in our daily operation. We are all receiving great benefit from our lessons and although we had one of our best years under the able leadership of W. E. Weaver last year we hope to do even better this year.

The officers elected to serve Dallas Chapter during 1952 are:

President, Tom Weatherford, Jr.
Vice-president, F. W. Cunningham
Secretary-treasurer, F. B. Riek, Jr.

At our last meeting James Baker, Fairbanks, Morse & Co., gave a very instructive lecture on centrifugal pumps. In connection with refrigeration and air conditioning centrifugal pumps are, of course, a very important part of the equipment where their use is warranted, and instruction in their proper care and maintenance is important in a refrigeration man's education.

Recently we welcomed to membership W. A. Higgs, William P. Short and R. R. Tribble of Proctor and Gamble, William B. Fortner, Merchantile Bank Bldg.; Jacob M. Irvine, Southern Properties, Inc., and Henry B. Philippsborn, Dreyfuss & Son.

William C. Reinhard

MEMBERS of the National Association of Practical Refrigerating Engineers were greatly shocked to hear of the sudden death Monday, January 21, at his home in Houston, Tex., of William C. Reinhard, charter member of the association. He was 72 years old.

William C. Reinhard

Mr. Reinhard took an active part in the affairs of the N.A.P.R.E. and was one of its strongest supporters. He became a charter member when it was organized as a national association January 30, 1910, and served as its president in 1930. He was very appreciative of the help obtained from this connection and said that he was able to put much of the knowledge gained therefrom into practice in his position as chief engineer for the Texas Ice & Fuel Co., Houston.

He was born in San Antonio but had lived in Houston for 50 years. He obtained his early refrigeration experience with the American Brewing Co. in Houston. He had been associated with the Texas Ice & Fuel Co. since June, 1922. During that time he supervised the construction of two ice plants for the company and one for the A. J. Zilker interests in Austin. In recognition of his work in the refrigerating field, Purdue University conferred an honorary engineering degree on him in 1949.

He was an honorary life member of the N.A.P.R.E. and greatly prized his large circle of acquaintances and friends among the members of that group.

He is survived by his widow, a sister and three brothers.

Continued Shortages of Basic Metals Predicted

SHORTAGES of steel, copper and aluminum are here to stay for some time, at least through the summer, and probably through the fall, according to John D. Small, chairman of the Department of Defense Munitions Board, who spoke at the Forecasting Conference of the Research Council of the Chamber of Commerce of Philadelphia, January 15. Mr. Small predicted a gradual amelioration of the situation in the second half of this year, provided no change for the worse occurs in world conditions.

Fins Reduce Temperatures In Refrigerator Cars

ADDITION of fins to the ice-containing bunkers of railway refrigerator cars has resulted in a temperature decrease of 2½ degrees F. in the cars, reports the Canadian National Research Council. This modification has been accepted by Canadian railways. Additional improvements in air circulation have reduced the temperature another 2½ degrees.

When foods and certain other biological materials are quick-frozen for preservation, the question arises as to whether the ice formed becomes continuous throughout the frozen material. Work with an artificial system indicates that cell membranes or concentrated cell saps may act as barriers to continuous ice formation thus preventing loss of flavor on thawing.

Food Processing Fellowship Established

A FOOD processing fellowship has been announced by the Illinois Institute of Technology. Founded by Food Processing Magazine, the fellowship provides $2,000 for one year graduate study at Illinois Institute of Technology leading to the degree of Master of Science in food engineering. The fellowship was established for the advancement of food engineering in the processing, handling and distribution of foods.

American Power Conference

THE first annual American Power Conference will be held March 26 to 28 at the Sherman Hotel, Chicago. Formerly it was known as the Midwest Power Conference, but was re-named recently to more adequately describe its scope and character. The Illinois Institute of Technology will continue to sponsor the meeting and the same group of 20 schools and societies will participate.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

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C. E. SIMMON, OKLAHOMA CITY, OKLA.

THIS MONTH IN BRIEF

Preliminary announcement of the program for the sixty-first annual convention of the American Warehousemens' Association indicates a constructive business program and an elaborate and varied after-business entertainment, followed by a post-convention tour of Mexico.

The Cold Storage Advisory Committee has recommended to the United States Department of Agriculture that research be initiated to study ways of improving packaging of perishable products.

Cold storage holdings on January 31 were down slightly; four points for coolers and two points for freezers, which was approximately twice the average change for this time of year.

The Fact Finding Conference of the American Institute of Poultry Industries, held February 10 to 12 discussed and heard addresses on production, marketing, financing, and other topics of current interest.

Full Program is Scheduled for 61st Annual Convention A.W.A.

THE 61st annual convention of the American Warehousemen's Association will be held at the Hotel Roosevelt, New Orleans, La., May 4 to 8, 1952. This has been announced officially by J. Leo Cooke, president of A.W.A. Included will be sessions of the National Association of Refrigerated Warehouses. The Refrigeration Research Foundation will hold its annual meeting at the same place, starting Friday, May 2.

With plans for the convention program rapidly shaping up under the hard-driving leadership of convention chairman Jay Weil, Jr., warehousemen may look forward with confidence, according to J. Leo Cooke, A.W.A. president, to a convention of unparalleled size and significance.

Pre-convention registration of delegates has begun. A report early in February states that 348 members of A.W.A. had already sent in their registrations. With a start like that all signs point to a record turnout in New Orleans. Registration at the convention business sessions begin at 9:30 a.m. Monday, May 5. Business program plans will be announced at a later date.

The N.A.R.W. office has had a heavy influx of letters commenting on a recent memo regarding customer requests for special clerical services. Indications are that the problem is a common one and that it is providing more than a few headaches to warehousemen who are fighting rising costs on one hand and diminishing returns on the other. The whole question is due for a thorough airing in New Orleans.

After-business entertainment will be among the most elaborate and varied of any meeting yet held, it is asserted. A gala "Sazerac Party" will be held Sunday evening by New Orleans warhousemen, 1952 convention hosts. In addition, a "Family Party" featuring a chartered boat tour of New Orleans harbor has been arranged for Monday. Tuesday evening will be "On the Town" night. Delegates will be free for the evening to explore the famed Vieux Carre region of the city. The A.W.A. President's Reception and Banquet is scheduled for Wednesday, with the final adjournment of the convention on the following day.

Rounding out the social side of the 61st A.W.A. convention will be a full program of activity for wives of the delegates. Luncheons, teas, and walking tours of famous points of interest in the old city will be included in the program of events.

Post Convention Tour of Mexico

One of the special attractions this year will be a post-convention ten-day tour of Mexico, May 9 to May 18, conducted by the United States Travel Agency. Leaving Friday, May 9, the party will go by airplane from New Orleans to Houston and from there to Mexico City from where tours and bus trips will be made to points of interest in and around the city including overnight stops at the Hotel Posada de la Mission, Acapulco. The return trip will be made Saturday, May 18, leaving for Houston at 10:30 a.m.

Commenting on the sights of Mexico "Cold Facts", edited by Wm. Dalton, energetic executive vice president of the National Association of Refrigerated Warehouses says those who make this trip will see little of the usual. The Floating Gardens of Xochimilco, outside Mexico City, are different than any flower show. Originally the islands of Xochimilco were reed rafts, now Mexican gondoliers pole flower-festooned boats through a kind of floral Venice that would make a botanist's eye bulge. Nature has done other phenomenal things in Mexico. Paricutin is a vigorous volcano, barely seven years old, that has grown thousands of feet high and spread its ash over 20 miles. It's a continuous performance, with the most impressive show at night. Close by Mexico City is another volcanic wonder, the Pedregal—a 14-mile stretch of hardened lava, brilliantly bordered by vast flower gardens.

A complete descriptive brochure of the tour is available from the office of the American Warehousemen's Association, Washington, D. C.

Tests on Gas Storage For Apples and Pears

GAS-STORED McIntosh apples in New York have been increasing the return to growers by 50 cents to a dollar per box and volume gas-stored has been increasing since 1946, according to "Apple Research Digest, published by state authorities in Yakima, Wash. In England, gas-storage is now recommended by the Food Investigation Organization for 11 of the 15 varieties of English apples. Six different relative percentages are advised for carbon dioxide and oxygen for these eleven varieties, and five different temperatures. Thus considerable precision has been achieved in the researches that support these recommendations.

Two to three extra months of storage life are reported to be obtained with gas storage of English varieties. The Williams and Conference varieties of pears can be kept in gas five to six months—in air, six weeks to three months. The research station responsible in England is the Ditton Laboratory, East Malling, Kent.

Much research has been done in the United States and in Canada on local varieties, of course, but the expense of small gas-tight rooms and doubtful profit have restricted use of this method, according to a recent report issued by the Refrigeration Research Foundation.

Pacific Northwest Chapter Meets

AT ITS annual meeting held at the Multnomah Hotel, Portland, Oregon on January 15, members of the Pacific Northwest Chapter of the National Association of Refrigerated Warehouses re-elected Earl Swanberg of Seattle as president for the coming year. Alex Olsson of Portland was elected vice-president, and Wm. L. Baker, Seattle, was elected secretary-treasurer.

The following were elected to serve as directors of the association for 1952: Richard D. Lamb, Freewater, Ore.; Lynn Mills, Portland, Ore.; Clarence Nelson, Tacoma, Wash.; Dr. George A. Anderson, Lynden, Wash.; Frank Congdon, Spokane, Wash.; Miss Elizabeth Nye, Spokane, Wash.; Donald C. Roberts, Salem, Ore.; Paul Henningsen, Portland, Ore.; John Bloxom, Yakima, Wash.; Lyle Thurman, Medford, Ore.

Storage of Auto Batteries

STUDIES on the storage of automobile batteries are under way at the Great Lakes Terminal Warehouse Co., Toledo, Ohio. The Standard Oil Company of New Jersey is cooperating. Batteries stored at minus 10, 0 and 32 F are being compared for loss of charge with batteries stored by Sohio in an unrefrigerated room. The tests began in September and were planned to continue several months. The initial results look very promising, according to an interim report by the Refrigeration Research Foundation and it is expected that additional information on this subject will be available soon.

A later report from one of the warehousemen interested in the study says that this has proved to be a nice business. The battery, he said, is easily stored and is a clean item to handle. When fully charged from the production line, it is rated at 1.275 specific gravity. If it is placed in a 32 F temperature, it will remain fully charged for three months. It will drop a few points of specific gravity, but is still considered fully charged. After three months, a battery will need a booster charge only before distribution to the field is made. Manufacturers are reported to be keenly interested in the possibilities of refrigerated storage of their product on a nationwide scale.

Massachusetts Warehousemen Elect Officers

ALL but one of the incumbent officers of Massachusetts Warehousemens' Association were re-elected January 15 when the association held its annual meeting at the Parker House in Boston. The single exception was that of Paul L. Amon who was nominated to fill a vacancy. The 1952 officers are: Christopher J. Grimley, president; Paul D. Burrill, vice-president; Paul L. Amon, secretary; H. S. Wiggin, treasurer; John F. O'Halloran, David B. Hollis, Jr., and William A. Harnaday, executive committee members.

Milwaukee Warehousemen Elect New Officers

THE Milwaukee Warehousemen's Association has elected new officers as follows: Philip G. Kuehn, president; William D. Vogel, vice-president; Anthony L. Fischer, secretary-treasurer; Philip G. Kuehn, Willis Warren, Norbert Meyer, Harold Willenson, and Anthony L. Fischer, directors.

Construction Applications Should be Filed Early

FOOD and fiber processors and wholesale food distributors have been reminded by the U. S. Department of Agriculture that applications for controlled construction materials should be filed at least 90 days before the first day of the calendar quarter in which construction is to begin.

This action is necessary to permit review of the applications and insure that allotments of controlled materials are made in time for successful applicants to place their orders, officials of the Department explained. They emphasized that such applications should be made only for construction projects which cannot be self-authorized and self-certified under regulations of the NPA.

Procedure for handling applications for authorized construction schedules and allotments of controlled materials for construction of agricultural and related projects is covered by Defense Food Order No. 5, USDA. Such applications should be filed with the State or Insular Production and Marketing Administration Office in the area where the construction is to be performed.

As announced in the February ICE AND REFRIGERATION, the Department of Agriculture is the claimant agency for controlled materials with respect to the construction of ice plants, public frozen food lockers, private warehouses, and wholesale food warehouses. Public storage warehouses, both refrigerated and dry, are the responsibility of Defense Transport Administration.

A review of the programs according to F. H. Hankes of the Transportation and Warehousing Branch has established that many projects have been delayed, necessitating rescheduling and revalidating of CMP allocations to subsequent quarters. The main reason for these delays was the tardy receipt of applications after the established date and screening delays caused by need for proper evaluation of the applications.

Applications for allotment of CMP materials should be received not later than ninety (90) days before the commencement of the quarter. Late applicants may be delayed in commencing construction, either through the exhaustion of materials or through inability to obtain a place on the mill schedule with an allotment that has been tardily issued. The Department has taken appropriate steps to speed up the review of applications for construction, and all those in the industry planning any construction are urged to file their applications early.

January 31 Cold Storage Holdings

ON JANUARY 31 public refrigerated storages were 59 and 81 percent filled in coolers and freezers, respectively. Following their seasonal patterns, cooler occupancy declined 4 points during January which was about average; the freezer occupancy decline of 2 points was twice the average change for this time of year. When compared with average January 31 operating levels, coolers were 3 points below but freezer utilization exceeded by 2 points the 1946-51 average and by a point the 1951 level.

Except for the Mountain area, January declines in cooler use were reported in all areas, ranging from 11 points (Pacific) to 1 point (East North Central). Although national freezer occupancy reflected a seasonal reduction in space utilization, several areas reported higher occupancy on January 31 than in the previous month. They were as follows: East and West North Central and East South Central regions.

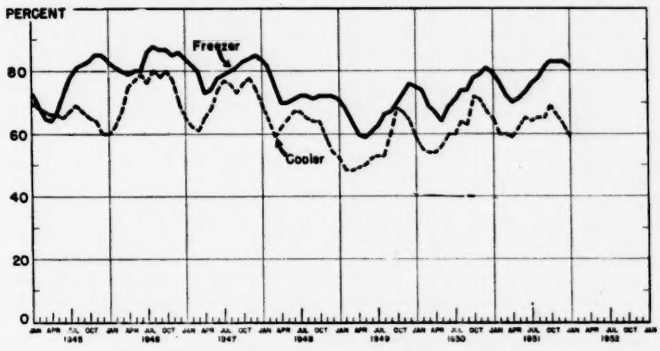
Gains up to 4 points were reported in the afore-mentioned areas as compared with seasonal declines reported in the remaining six regions. Citywise, cooler space appeared to be readily available as no report was made of occupancy greater than 83 percent. On the other hand, freezer space appeared to be at a premium in Philadelphia, Cleveland, Detroit, Minneapolis, St. Louis, Kansas City, Baltimore, Richmond, Norfolk, Nashville, Memphis, Los Angeles, and San Francisco.

Cooler and freezer-held stores totaled 4.3 billion pounds on January 31 as seasonal reductions of cooler-stored commodities brought the total down to 2 billion pounds while freezer-stored items increased to 2.3 billion pounds. The net change in cooler weights during January was a reduction of 313 million pounds, but freezer weights increased 10 million pounds. By comparison, stocks in refrigerated storage this year were 7 percent less than a year ago.

Stores of fresh apples amounted to 16 million bushels on January 31 as net withdrawals of 6 million were reported during the month. This net change was about average and was equal to the withdrawals last year. By comparison, current holdings were almost a fourth less than January 31 average stocks and were about two-fifths less than last year.

Withdrawals of pears during January more than halved December 31 stocks and by the end of January total holdings were down to 638 thousand bushels. This compares with over a million bushels in store last year and on January 31 during the 5-year period ended 1951.

Frozen fruit stocks were reduced to 301 million pounds by January 31 or a reduction of 31 million during the month. The out-of-storage movement exceeded by 7 million pounds the January average change and by 9 million pounds the net withdrawal last year. When compared with average January 31 supplies and those last year, current stocks were



Occupancy of Refrigerated Warehouses 1944-1951

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS)

	Jan. 31, 1951	Dec. 31, 1951	Jan. 31, 1951	Five-year Average
Meat and meat products, lbs.	1,081,122	912,247	959,886	885,009
Lard and rendered pork fat, lbs.	49,425	53,614	89,321	119,876
Frozen poultry, lbs.	297,754	302,151	284,623	267,843
Creamery butter, lbs.	13,640	27,051	75,329	45,869
American cheese, lbs.	162,976	194,784	155,117	125,299
Other cheese, lbs.	16,596	18,334	17,764	17,460
Shell eggs, cases	244	141	75	233
Frozen eggs, lbs.	53,422	67,200	31,157	72,195
Apples, bu.	16,085	22,113	27,273	20,507
Frozen fruits, lbs.	300,743	331,411	312,744	312,047
Frozen vegetables, lbs.	444,502	498,340	375,269	310,359
Frozen fish, lbs.	148,225	168,792	130,880	124,692

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		Jan. 31, 1952 (%)		Dec. 31, 1951 (%)		Jan. 31, 1951 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,181	6,085	45	83	50	87	64	88	55	82
Middle Atlantic	34,667	31,952	57	81	64	84	64	82	61	78
East North Central	26,759	22,821	63	85	64	84	69	86	63	81
West North Central	9,093	14,588	53	87	56	86	74	88	70	86
South Atlantic	8,839	7,076	64	85	67	86	57	81	62	83
East South Central	2,655	3,135	68	92	74	88	70	80	68	83
West South Central	6,639	7,423	61	62	63	63	60	62	62	72
Mountain	1,425	2,486	57	90	53	92	50	71	55	78
Pacific	14,907	23,069	56	74	67	79	61	72	56	72
United States	108,165	118,635	59	81	63	83	65	80	62	79

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Jan. 31, 1952		Dec. 31, 1951		Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent Jan. 31, 1952		Dec. 31, 1951	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	7	6	50	50	50	82					82	
Middle Atlantic	1,221	1,457	40	80	56	79	1,848	267	65	79	64	80
East North Central	3,468	5,169	74	78	84	77	4,774	1,368	89	95	94	96
West North Central	389	2,229	87	77	99	77	12,028	5,790	92	94	92	87
South Atlantic	655	4,184	69	61	79	60	1,000	173	87	100	85	100
East South Central							302	109	100	94	100	86
West South Central	144	65	76	88	85	85	2,525	500	100	100	100	100
Mountain	106	41	92	68		78	701	418	84	98	97	100
Pacific	2,951	3,550	41	74	52	78	2,642	480	95	92	95	95
United States	8,941	16,701	59	72	71	73	25,820	9,105	90	94	87	93

NOTE:—Blank spaces indicate that insufficient returns were received.

4 percent less but stocks of blueberries, cherries, and strawberries were in excess of their respective 5-year average level. Except for frozen apples, all fruit items reflected seasonal net withdrawals ranging from less than a million pounds to 12 million. The greatest seasonal declines were reported in stocks of cherries, peaches, raspberries, and strawberries which amounted to approximately 22 million pounds. Frozen orange juice holdings increased during January to 10.5 million gallons as compared with 9.9 million in store December 31. Other fruit juices and purees fell off to 59 million pounds.

Frozen Vegetables

Frozen vegetable stocks were reduced 11 percent since December 31 to total 445 million pounds. This compares with 375 million on hand last year and 310 million in store January 31 for the 5-year period ended 1951. Without exception, all vegetable items reflected seasonal net reductions, the largest being reported in stocks of peas—18 million pounds. Frozen lima beans were reduced by 9 million pounds which was almost twice the average seasonal change, but holdings were still almost three-fourths greater than average. Other vegetable items reflected smaller reductions such as 6 million pounds for snap beans and 5 million pounds for sweet corn.

Cream in storage on January 31 amounted to 10 million pounds as compared with 16 million in store a month earlier and 6 million on hand last year. Average January 31 stores were 17 million pounds.

National holdings of butter were reduced by half during January, leaving approximately 13 million in store by the end of the month. These stocks were about equal to the record January 31 low reported in 1948 and compares with 75 million pounds in store last year and 46 million pounds on hand January 31 during the 5-year period ended 1951.

American Cheddar cheese holdings were reduced to 163 million pounds but continues to be at a record high for this time of year.

Shell eggs reflected a gain of 103,000 cases to reach 244,000 cases.

Frozen eggs amounted to 53 million pounds as compared with 31 million in store last year.

Poultry

Poultry stocks were reduced by less than average amounts during January and by the end of the month amounted to 298 million pounds. These supplies were greater than average and those last year by 30 and 13 million pounds, respectively.

National holdings of meats were at near record levels for this time of year with well over a billion pounds reported in storage on January 31. Commodity-wise, beef holdings totaled 235 million pounds; pork, 697 million pounds; other meat items, 149 million pounds. During January the into-storage movement of meats exceeded the average January accumulations (169 million vs. 151 million), and by the end of the month beef stocks were 75 million pounds in excess of average January 31 supplies. Pork exceeded the average by 118 million pounds. Lard and rendered pork fat stocks fell off to 49 million pounds as net withdrawals of 4 million pounds were reported during January.

Fishery Products

Stocks of frozen and cured fishery products were reduced during January by 21 and 4 million pounds, respectively, leaving a total of 167 million pounds in store by the end of the month. The 148 million pounds of frozen fishery products in storage were 13 percent greater than holdings last year and 19 percent greater than average. Area-wise, stocks of frozen fishery products amounted to approximately 33 million pounds in the New England and Middle Atlantic storages, respectively; Pacific and Alaska storages held 31 million pounds.

Storage Outlook

Cooler space utilization should continue its downward cycle during February and end-of-the-month occupancy should average about 55 percent. A net reduction of this amount is the average expected change although during February 1951 the change was greater. Should the average change prevail this year, cooler utilization will be about equal to the 1950 level which was the second lowest February on record since 1952. Freezer occupancy by the end of February is expected to be lower than the 81 percent reported January 31. According to historical performance, a decline of 3 points is expected. However, freezer occupancy decreased faster during January than the average would indicate and with frozen fruits and vegetables likely to continue to reflect above average net withdrawals during February, occupancy by the end of the month may not be above 77 percent.

Canadian Holdings of Fruits and Vegetables

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, reports the following commodities held in cold storage on January 1, 1952.

Apples in cold and common storage on January 1, 1952 amounted to 3,856,000 bushels as compared with 5,282,000 bushels December 1, 1951 and 6, 101,000 bushels January 1, 1951.

Frozen fruit holdings in storage and factories January 1, 1952 amounted to 21,877,000 lbs. as compared with 23,882,000 lbs. December 1, 1951 and 16,545,000 lbs. January 1, 1951.

Stocks of frozen vegetables in storage and factories on January 1, 1952 amounted to 13,381,000 lbs. as compared with 13,293,000 lbs. December 1, 1951 and 12,629,000 January 1, 1951.

Fact Finding Conference Brings Poultry Men Up-to-date on Modern Methods

PRODUCTION, marketing, financing and other business topics of current interest were discussed at the Fact Finding Conference of the Institute of American Poultry Industries held at Kansas City, Mo., February 10, 11 and 12.

Industry Information

Who's to blame when something happens at Washington that isn't good for the poultry and egg industry? Edward Priebe, Jr., Priebe and Sons, Inc., Chicago pointed out in an address that often it's industry's own fault, for not keeping public officials, and the public, well informed so they understand the industry and its problems. Referring to the facts and figures the Institute presented before the Banking and Currency Committees in Congress last spring, Mr. Priebe said, "That hearing impressed me with how little information most Congressmen have about our business. Facts we're so familiar with that we take them for granted were literally startling to them. The Institute is doing everything possible to develop understanding of our industry in Washington—but it seems to me we have some responsibilities as individuals too. I think it's up to us to know our Representatives and our Senators and see that they know something about our industry." The same thing is true with government agencies, he said.

Forecast for 1952

C. C. Warren, U. S. Department of Agriculture economist, believes chicken, turkey and egg consumption are closely tied to the amount of money consumers have to spend, that the poultry industry will do well to continue to step up its productive efficiency to protect its position in case consumer incomes fall off, and that changing patterns and practices in the poultry industry call for changing and expanding some of the statistical reports now available from the government.

In a quick look at what's ahead for 1952, Mr. Warren stated the expected increase of about three million cases of eggs during the first half of the year should not prove to be any particular problem. A population increase of nearly two million people, he pointed out, will use about a million more cases if last year's consumption rate holds up during the spring. And a 3 to 5 cent decline in prices, he added, is all it should take to encourage the use of two million more cases in the form of increased consumption, increased shell egg storage, increased frozen egg production and increased dried egg production.

Selling to Armed Forces

The Armed Forces would like to see more suppliers offering poultry and eggs to the Quartermaster Market Center System, according to Colonel C. F. Kearney, commanding officer of the Quartermaster Market Center System.

There's hardly a working day when the QMC system doesn't buy at least 8 to 10 carloads of eggs and the same number of cars of chicken and/or turkeys. They're in the market constantly. Their policy is to buy more when more is being produced, of course, and less when less is being produced—provided keeping quality, supply problems and total requirements permit. To some extent, then, QMC buys more eggs during the peak production months of March and April, holding some stocks for consumption during late summer when production drops to its low point.

Last year QMC bought about 4.1 million cases of shell eggs—and would have bought more if it hadn't been for the lag in spring production and higher prices. The 1952 menu calls for about 2 eggs per man per day—about the same level authorized for 1951.

Government Restrictions

Every day it's getting more and more difficult for the poultry and egg industry and other industries to do business. The multitude of regulations and restrictions coming out of Washington are to blame, according to Joseph O. Parker of the Pace and Parker law firm. In an effort to make the Washington picture a little less complicated for poultry and egg men, he presented some thumb-nail sketches of the various government agencies that affect poultry and egg operations. Mr. Parker is the Institute's legal counsel in Washington.

Most of his talk dealt with new government agencies—agencies created under the Defense Production Act which issue orders and regulations poultry and egg firms have to comply with. Three of these—the Office of Price Stabilization, the Wage Stabilization Board, and the Salary Stabilization Board — make the businessman's existence particularly difficult because their orders and rulings are so complicated and confusing. Also, in the case of price control activities, the industry advisory committees provided by law have not been used to their fullest extent, and a common complaint among most of these committees is that their advice has been ignored or that they've been called together merely to approve a decision already reached.

Baking Demonstration

What happens when bakers fail to get the kind of frozen eggs they need was brought to light in a special baking demonstration staged by Adrian J. Vander Voort, head of the baking school at the William Hood Dunwoody Industrial Institute. Mr. Vander Voort baked several cakes on stage. One of them turned out unsuccessfully because a little yolk had gotten into the frozen whites, something that can be avoided in the egg breaking plant if the yolks and whites are separated carefully. Another cake was a failure, because the egg products used in it were low in solids.

Many bakers would soon be out of the cake business, Vander Voort said, if they tried to sell cakes like these. Uniformity and quality in egg products are absolutely essential if bakers are going to produce the best possible baked goods. "Those in the egg industry who don't accept this challenge will be found wanting and lost by the wayside," Mr. Vander Voort warned.

4-H Club Work

Teen-age "salesmen" are helping to teach Montana consumers more about eggs these days. What these boys and girls are doing to help consumers spend their egg money wisely is also helping to build up consumer demand —and create better outlets—for quality eggs. That's why egg people from all over the nation were interested in the presentation Harriette E. Cushman, Montana poultry extension specialist, and Elaine Stirland, 4-H Club member from Chinook, Montana, made.

Working with Montana State College nutrition and poultry specialists, these teen-agers—members of 4-H Clubs in the state—are spurred on to do their best on this project through a two-way contest. First, they have to study egg grades and learn how to grade eggs by candling. Second, they have to learn how to demonstrated differences between A, B and C grade eggs—and how to use these demonstrations effectively in consumer educational work—to get the story of egg quality over to retailers and housewives.

Cleaning Eggs

After running out of answers to that eternal problem—dirty eggs—Poultry Producers of Central California are "back to fundamentals." This is the reason PPCC has launched its clean egg program, L. N. Thompson told the Institute. For years they've had a dirty egg and washed egg problem, and for years they've tried to find the answer. But their real trouble started about four years ago, about the time mechanical washers started to become popular with producers in California. Prooducers who bought this equipment started washing all their eggs. Sour eggs in unusual numbers turned up in storage. Complaints on fresh egg quality came in almost daily.

Complaints from all types of accounts added up to thousands of dollars loss—and brought things quickly to a head. PPCC realized they would have to set an example for their producers, if they really wanted to make a clean, unwashed egg program stick.

The program was planned and put into effect. Slowly but steadily there were results. The percentage of clean unwashed eggs began to increase and the condition is improving steadily, until now, Mr. Thompson says, the clean egg program is here to stay.

State Egg Laws

"Good state egg laws can help industry—but there are no substitutes for refrigeration, good candlers and business integrity." This is the conclusion Ralph S. Yohe made in his talk, "Are State Laws Good Crutches to Lean On?" After analyzing the various types of laws on the books of different states, and their effects—Mr. Yohe found the laws themselves were not as different as you might expect. But their effectiveness was something else again. This was due in part to the ability of state officials to enforce the regulations. It also depended, however, on the industry's interest, in each state, in doing a good job on egg quality.

Frozen Egg Quality

If a frozen egg operator is having trouble with his finished product, it may stem from the initial quality in the shell eggs he uses, from the wrong combination of churning, filtering and milling processes, or even from confusion over the type of product needed by the baker he sells to. Richard H. Forsythe, of Armour & Co., gave frozen egg operators some practical pointers on these particular performance factors, in his talk, "Are You Getting the Right Results With Your Liquid Eggs."

Mr. Forsythe said the churning process is used to make a more uniform and homogenous product, filtering is designed to free the product from extraneous matter such as shell particles, and milling is used to disintegrate the thick white gel and increase whipping rates. Some of these processes may overlap, however, when certain types of equipment are used. This may result in over-treating, destroying some of the functional performance.

Producing Better Eggs

Reports on producing higher quality eggs were presented by Dr. A. W. Brant, U. S. Department of Agriculture, Dr. E. E. Schnetzler, DeKalb Agricultural Association, and Dr. W. J. Stadelman, Washington State College.

A survey carried out under Dr. Brant's direction in 1951 showed that albumen quality of fresh eggs in two egg laying contests averaged a high Grade A in the spring but dropped to a middle Grade A in the summer. Thin shells increased too—from 21 percent of the eggs in the spring to 41 percent in the summer. Blood and meat spots were found in 10 percent of the eggs, with no seasonal trend indicated. As expected, Leghorns had fewer blood and meat spots than heavy breeds. Albumen quality and shell thickness didn't vary much between breeds, but they did vary considerably among individuals, families and strains. Since these factors are inheritable, the survey emphasizes the need for egg quality to be included in breeding programs in the future.

Housing for Broilers

C. F. Parrish, extension poultry specialist from North Carolina State College, and R. L. Hogue, Purdue University extension poultryman, presented a panel discussion on the best housing and equipment to use for broilers. "Combine comfort and economy," said Parrish, "and you'll be on the right track on housing."

Operating Costs

Edward W. Priebe, Jr., and E. L. Lowery of White Oak Acres, Inc., analyzed operating cost figures and factors in a two-way panel on "What the Figures Show." They compared figures furnished by various firms throughout the country. These figures showed that the individual operator can do something about cutting costs, instead of just blaming the government or the market every time he doesn't do as well as his competitors and letting it go at that.

According to Mr. Priebe, none of them can afford to be satisfied with his operating costs. They have to watch them and keep figuring out how they can cut them. No one answer is right for everyone. It's an individual problem. They have to work it out for themselves. But they can get helpful ideas from what other people in the industry are doing.

Sanitary Problems

A study of the sanitary and hygienic problems in poultry plants has been undertaken by the U. S. Public Health Service, in cooperation with state and local health departments. This and other poultry sanitation activities planned by the government agencies were discussed by Dr. James H. Steele, of the U. S. Public Health Service, in a panel on "What Are Improvements in Good Housekeeping Worth?" His fellow panel member, Dr. C. H. Koonz of Swift & Company, reported on the sanitation progress already made by the established poultry processing industry, and indicated the types of improvements that will pay off in the future.

For the time being, said Dr. Steele, the regulation and code approved by the Poultry Sanitation and Inspection Committee of the Conference of Public Health Veterinarians is being used as a guide by many local and state health departments. This code covers plant inspection, lighting, ventilation, toilet and lavatory facilities, water supply, plumbing and waste disposal, construction and location of utensils and equipment, storage, refrigeration, wholesomeness and inspection, plant operation, employees' hygiene and health and environmental sanitation.

The big problem, said Dr. Steele, rests with the smaller plants, and is a responsibility of the state and local health agencies, to whom the U. S. Public Health Service acts as a consultant.

Merchandising

S. R. Bernstein, editor of Advertising Age was one of three specialists who presented a panel on "What Is Good Merchandising" at the Conference. Walter B. C. Washburn, vice president of Young &. Rubicam, Inc., advertising agency, and E. Gardner Cole, head of poultry merchandising for Swift & Company, were the other two members of the panel.

Bernstein believes that there are more than a few indications that more and more producers are becoming merchandisers, staying with their products until they reach the ultimate consumer — even in the fresh foodstuffs field. This trend, he pointed out, is one very important reason people in the poultry and egg business must give serious consideration to more merchandising, whether they want to or not. Competition between different products goes on all the time. Price is an important factor in this daily competition, but other factors are almost equally important—convenience, packaging, standardization of taste and flavor, and keeping a product modern.

Buying Eggs on Grade

An interesting case history of one of the pioneers in buying eggs on grade, cartoning at the plant, and selling to quality retailers, the C. W. Hawes Company at Whitewater, Wisconsin, was presented by C. Howard King, from the Wisconsin State Department of Agriculture. At present Hawes is cartoning three different "classes" of eggs, with the grade marked on each carton. His top pack contains all A grade eggs, all larger than the minimum permitted for Large. His second pack is brown or mixed color grade A large eggs. And his third pack is Grade A Mediums.

Selling Quality Poultry

When it comes to buying poultry, the modern housewife is far more quality conscious than price or value conscious. This is one of the things that led the Kroger Company to start shifting over to a 100 percent ready-to-cook merchandising program for poultry soon after the war ended—a program that tripled their poultry sales.

Paul J. Flinn, head of poultry merchandising for the Kroger Company, traced the development of this modern retailing program during the war and early postwar years, a lot of poultry was frozen, cut-up, box packed poultry which had been prepared from defrosted N. Y. dressed birds. It had to be sold out of the conventional type meat case because there weren't enough frozen food cabinets. Everything went fine, Flinn recalled, as long as the demand was good and the turnover rapid. But when other meats were available and poultry didn't sell fast enough to keep from defrosting and souring — too many times inferior quality poultry found its way into the consumer's kitchen and Kroger faced a good chance of losing the poultry business.

It was this situation which led to a detailed merchandising and operation plan for store managers which emphasized frequent ordering, prompt refrigeration, inspection for quality and condition, and display.

Method of Pasteurizing Liquid Whole Eggs

AN EFFECTIVE method of pasteurizing liquid whole egg has been developed through research by the U. S. Department of Agriculture. The new method employs the type of equipment ordinarily used for pasteurizing milk.

Heretofore, the industry has not known the time and temperature required for heating liquid egg to insure a complete kill of Salmonella bacteria without adversely affecting the commercial usefulness of the product. The research work tested the effectiveness of pasteurization at various combinations of time and temperature. The tests demonstrated that a process in which a temperature of 140 F, which is just below the coagulation level, is held for three minutes, proved effective in eliminating Salmonella under commercial operating conditions. The functional properties of the resulting liquid egg were affected very little and the keeping qualities were improved.

Although the equipment now in use in several egg processing plants can be adapted to the pasteurizing of liquid egg, close attention must be given by plant employees to the maintenance of the correct temperature and timing to assure proper processing for the production of a Salmonella-free product.

Details of the process, developed in experiments conducted by the Poultry Branch of the Production and Marketing Administration under authority of the Research and Marketing Act, are explained in a report "Pasteurizing Liquid Egg Under Commercial Conditions to Eliminate Salmonella." A copy of the report may be obtained from the Office of Information Services, Production and Marketing Administration, U. S. Department of Agriculture.

Refrigerated Warehousing

Freezing Storage for Hops

RETENTION of desirable brewing of fresh hops during freezing storage has been studied by the German Food Technological Institute at Munich (Institut Fur Lebensmitteltechnologie). Storage above 23 F was not successful but as lower freezing temperatures were used, the fresh-frozen hops were considerably superior to dried hops in quality. The disadvantage of rapid deterioration of essential components during defrosting was made up by the considerably higher yield due to easy breaking up of the hop "flowers" or cones.

Important was the rapid initial lowering of temperature and freezing. Therefore, freezing fresh hops in baled form is not recommended. The investigations continue. The Refrigeration Research Foundation reports that it has followed similar semi-commercial trials in this country. The bulk problem of a light material like hops is difficult to solve, especially if baling or compression are not recommended.

Packaging Big Business

EIGHT billion dollars is being spent annually to package American products and another half billion is going into packaging research, says C. K. Royce, chairman Technical Committee, Federal Specifications Board. On V-J Day, Mr. Royce continued, more than half the timber harvest of the United States was going into manufacture of packaging materials; thus wartime packaging is really big business. The new and wider ranges of temperature which must be considered in our current planning place an even heavier burden of performance on packaging materials. In addition to high temperature and humidity conditions, we must engineer our packages to meet low temperature requirements, he said.

Wilson Represents A.W.A. On Fire Protection Assn.

REPLACING the late Lee Cotter, AWA past president Horace W. Wilson of Philadelphia was appointed by the National Fire Protection Association to help represent the warehousing industry as a member of the General Storage Committee of the Association. Other committee members are: W. J. Baker, Philadelphia, Chairman; Elmer Erickson, Chicago; A. Gordon Janney, Baltimore.

Handling Apples in Storage

THE costs of receiving field boxes of apples at Pacific Northwest packing and storage houses, using current methods and types of equipment, range from a high of $9.58 to a low of $1.93 per 1,000 boxes, the U. S. Department of Agriculture reports.

A survey by the Washington State Apple Commission of 252 apple packing and storage houses in that State, under a Research and Marketing Act contract with the Department, shows that many plants could increase the efficiency of their receiving operations by adopting improved methods and types of equipment now in use in other plants. The survey shows that basically six different methods involving different types or combinations of types of handling equipment were used for receiving field boxes of fruit.

Comparative cost studies of five currently used methods were made during the 1950-51 season in 15 plants selected to represent a cross section of Washington State apple houses. In these houses operations were timed to obtain data on the hours of labor and equipment required. In addition, data were obtained on the costs of owning and operating equipment of the various types used.

Cost Data

The costs of receiving 1,000 field boxes of apples with each of the five methods studied (the sixth method involving the use of elevators is now being studied) are: (1) Belt conveyors and clamp-type two-wheel hand trucks, $9.58; (2) clamp-type two-wheel hand trucks alone, $6.75; (3) floor chain conveyors and clamp-type two-wheel hand trucks, $7.49; (4) industrial clamp-type trucks and clamp-type two-wheel hand trucks, $5.17 where 24 boxes are transported per load and $3.58 with 36 boxes per load; and (5) pallets and industrial fork-lift trucks, $2.18 where 36 boxes make up a pallet load, and $1.93 with 48 boxes per pallet. (A clamp-type truck has clamps which grip a stack of boxes, so that they may be lifted and rolled away.) Transportation distances with all five methods were adjusted to 100 feet.

These costs were computed on the basis of assumed wage rates of $1.25 per hour for common labor and $1.50 per hour for semi-skilled labor. The combined costs per hour for the types of equipment used are: (1) Belt conveyor, $0.71; (2) clamp-type two wheel hand truck, $0.05; (3) floor chain conveyor, $0.95; (4) industrial clamp-type truck (2,000-pound capacity), $1.80; (5) industrial fork-lift truck (2,000-pound capacity). $1.53; and (6) industrial fork-lift truck (4,000-pound capacity), $2.01.

Where existing facilities are suitable and the annual volume handled is sufficient, storage house operators now using older methods and types of equipment could reduce their receiving costs by adopting the fork-lift truck. A plant that receives 300,000 field boxes of fruit during the harvest season should, if no major alterations in the facility are necessary, save more than $2,000 per season on its receiving operations by converting from belt conveyors and clamp-type two-wheel hand trucks to a pallet and fork-lift operation with 48-box loads.

Bankers and Warehousemen Discuss Warehouse Receipts

REFRIGERATION warehousemen and local bankers got together in San Antonio on January 16 to discuss warehouse receipts and commodity loans. The meeting was arranged by C. M. (Chick) Smith, a member of the National Association of Refrigerated Warehouse Committee on Banking. Mr. Smith reports that the meeting was a big success with both warehousemen and bankers learning more about each other's problems.

Carload Storage Of Citrus Fruits

TESTS on storage of carload lots of Florida oranges and grapefruit, involving 18 carloads were conducted last summer under auspices of the Refrigeration Research Foundation. Controlled tests were made at the New York (17th Street) warehouse of Merchants Refrigerating Co. and at Orlando, Fla., along with the commercial storage tests at Newark (Merchants Refrigerating Co.) and Providence (Merchants Cold Storage & Warehouse Co.). Final reports will not be completed for several months.

An enormous amount of detailed work was necessary for those engaged in active conduct of the studies in order to reach evaluations of the results. The previous years' work has shown a steady accumulation of practical information that has been put to use.

This year's results indicate, in the opinion of one of the workers, that prospects for Florida orange storage are even more encouraging than previous years of work have indicated. This statement is based on excellent results in control of decay from the use of the Dowicide-a-Hexamine fungicidal dip accompanied by the use of diphenyl liners. The outlook for long-term summer storage of grapefruit, however, does not look very promising at this time.

Pacific Dairy and Poultry Association

THE annual convention of the Pacific Dairy and Poultry Association will be held at the Hotel del Coronado, Coronado Beach, Calif., March 15 to 17. Louis Arata, Merchants Ice & Cold Storage Co., San Francisco, is chairman of the warehousing and storage committee and will be in charge of all arrangements at the convention for the warehousing industry groups.

Advisory Board of the association is shown in the accompanying photograph. Front row: R. H. Cronshey, secretary Challenge Cream and Butter Assn., Los Angeles; Glenn Olson, Olson Brothers, Los Angeles, treasurer PD&PA.; E. H. Telaneus, Armour & Co., Los Angeles, president, PD&PA; C. E. Reifsteick, assistant executive secretary PD&PA. Back row: Rune F. Goranson, executive secretary PD&PA; Paul Mannen, Mannen Egg Co., La Mesa, Calif. PD&PA convention chairman; Dean Olson, Olson Bros., Los Angeles, past president PD&PA; G. H. Brockmeyer, Los Angeles, past president PD&PA.

Cold Storage Committee Asks Research on Packaging of Products

A RECOMMENDATION that research be initiated to study ways of improving packaging of perishable products to protect quality, preserve food, avoid waste and save marketing costs was made by the Cold Storage Advisory Committee to the U. S. Department of Agriculture at its meeting January 9-11 at Albany, Calif. Pointing out the value of such investigations to national defense, the Committee named under the Research and Markekting Act, also urged that agricultural research in general be maintained on a level sufficient to protect the national interest on a long-range basis.

The Committee, which advises the Agricultural Research Administration, said, "Curtailment or abandonment of essential agricultural research at this time is considered a very unwise policy."

The committee inspected the eastern Regional Research Laboratory of the Department at Albany, and examined the status of current research progress. It commended especially the Department's program under the Research and Marketing Act, and urged expansion of central research projects records so as to provide for more effective coordination.

Study of work at the laboratory showed, the committee said, the need for proper emphasis on basic research, with a sound balance between basic and applied research. "Basic research very often is long-range in nature and very often usable results are not immediately forthcoming," the committee commented. "It is therefore important in the committee's opinion to point out the desirability of continuing such investigations, once begun, to a logical conclusion."

High Priority Recommendations

Among other recommendations given high priority were:

1—A study of comparative costs and efficiency of freezing and storing farm products in locker plants.

2—A study of the adequacy of farm and home freezers in freezing farm products, especially meats.

3—A study of the causes and how to eliminate bone darkening in poultry products during frozen storage.

4—A study of shrinkage in meat during freezing and storage.

Of research already in progress, the following are representative of projects on which the committee urged special emphasis: Effects of temperature fluctuations on the quality and storage life of frozen foods; frozen milk concentrates and their storage requirements; atmospheric control, modification, and purification in refrigerated warehouses; basic study of enzyme system in fruits and vegetables as related to quality; effective air velocities in cooling perishable products for transportation and storage; basic and applied research on quality specifications, such as color, on both raw and processed frozen products, refrigerated storage of citrus fruits and grapes, and freezing and storage of poultry, especially turkeys.

Prompt Reporting Of Results Asked

The committee also laid stress on the need for prompt reporting of research results, and urged greater use of interim or progress reports, correction of budgetary restrictions on the type of information work designed to disseminate the findings of research to industry and agriculture, and suggested that a research magazine be published by the Department to carry abstracts on research and provide other significant information useful to research workers and farm and industrial users of research findings.

The committee met for part of the time (January 9-11) jointly with the Department's Vegetable Advisory Committee. All members of the Cold Storage Advisory Committee were in attendance. They are:

Paul B. Christensen (chairman), New York, N. Y.; A. R. Current, the City Products Corp., Chicago, Ill.; H. C. Diehl, director, Refrigeration Research Foundation, Colorado Springs, Colo.; Arnold T. Hampson, Merchants Cold Storage & Warehouse Co., Providence, R. I.; Walter F. Henningsen, Sr., Northwestern Ice and Cold Storage Co., Portland, Ore.; Harold J. Humphrey, Birds Eye Division, General Foods Corp., New York, N. Y.; C. A. Martin, Polar Cold Storage, Inc., Nashville, Tenn.; Harlan J. Nissen, Terminal Refrigerating Co., Los Angeles, Calif.; R. G. Purnell, Quick Frozen Foods, Inc., Tupelo, Miss.; S. C. Rogers, G. H. Hammond Co., Chicago, Ill.; and Leo B. Wooton, Ninth Street Skookum Growers, Inc., Wenatchee, Wash. J. Roy Allgyer is executive secretary of the committee.

Refrigerated Warehousing

Film Wrappings Extend Storage Life of Lemons

THE storage life of lemons may be extended two to three weeks and the fresh quality retained by wrapping the fruit at the market city in any of several different transparent films and holding at 50 F., say plant scientists of the U. S. Department of Agriculture.

In prepackaging tests conducted in New York City, H. W. Hruschka and J. Kaufman of the Bureau of Plant Industry, Soils, and Agricultural Engineering, found that lemons held at 50 F. kept without loss of weight or shriveling for one to four weeks when wrapped in either perforated or nonperforated Pliofilm or moisture-proof cellophane; one to four weeks in nonperforated, semi-moisture-proof cellophane; one to two weeks in nonperforated cellulose acetate paper; and one week in kraft paper bags with cellophane windows. Unwrapped lemons stored at the same temperature had lost nearly five percent in weight at the end of four weeks.

Shelf life, as measured by loss in weight and shriveling, was reduced 25 to 30 percent by storage at 70 F. However, some of the film wrapped fruit was still salable at the end of four weeks, but all of the unwrapped fruit had to be discarded at the end of the second week.

The findings are reported in H. T. & S. Office Report, No. 261. A limited number of copies are available.

Black Spot in Potatoes

INTERNAL black spot in Long Island and Red River Valley white potatoes is known to be increased by mechanical bruising and to be more prevalent in potatoes handled or bruised while held at low temperature. Where black spot is suspected or known to be of potential importance, it is advisable to avoid grading or otherwise handling while they are cold. Warming up prior to handling to 50 or 55 F or better to 65 F is beneficial, two to three days and preferably about a week before handling.

These recommendations are based on studies by J. S. Wiant, H. Findlen and J. Kaufman of Bureau of Plant Industry, USDA, Plant Industry Station, Beltsville, Md., reported by the Refrigeration Research Foundation. Some phases of the problem, such as handling methods for susceptible potatoes, susceptibility of other varieties, etc., will require further study, it was stated.

Pacific Coast Refrigerated Storage Expands

(Continued from page 24)

room along one edge of the room. A battery of four axial flow fans draws the cooled air through the coil system, force it through the product and return it along the floor line to the underside of the coil bank. As the freezer will be operated for quick freezing of products to be stored in the holding rooms and at uncertain intervals, accurate control of temperatures is unnecessary and the controls in the engine room are sufficient to maintain the desired temperatures.

Construction Work Is Under Way

Construction work is already under way. Two old buildings have been removed and the general contractor is now driving piling and pouring concrete on the foundations of the new building. The scheduled date of completion has been set for July 1952. The Merchants Ice and Cold Storage Company, of which Louis Arata is general manager and Peter Bercut is president, awarded the work under two contracts.

The contract for the refrigeration equipment and its installation is held by The Ralph E. Manns Co. of San Francisco. The contract for the building and other construction is held by Cahill Brothers of the same city. Kenneth D. McGrew and Swan A. Erickson, consulting engineers, supplied the plans for the complete plant and are supervising the construction.

Quebec Ice Harvesters Report Shortage

THE hardy ice cutters around Verdun and Lachine near Montreal, Canada, are preparing to put their equipment back into mothballs for another year. The situation, they said, is just that bad.

The usual winter icefields on Lake St. Louis in the vicinity of Lachine are covered with water. Except in the bays and around the canal there is little or no ice. One dealer who has been cutting in the Lacine-Caughnawaga area for 41 years gloomily predicted there would be little done this year.

Even after a prolonged cold spell with weather below zero it takes almost a month to get good cutting ice, the experts said. And the way the weather has been to date with so many mild days, it doesn't look like there will be any lengthy cold spells. The heaviest ice in the district is about 12 inches thick and good ice should be more than 18 inches.

Canadian Natural Ice Shows Decline – A Boost for Manufactured Ice

FEBRUARY, the usual month for natural ice harvesting, is showing exceedingly poor results, according to a news report from Montreal, Canada. It is reported in the trade that such harvest will be very much reduced this year. This is expected to greatly increase the districts output of manufactured grades, said plant heads.

There are indications that there will be an even greater demand this spring and summer for crushed ice and, to some extent, cube types, than obtained in 1951 which is reckoned on the books as an excellent season in this respect. The butcher, grocer and the smaller importer of fruits and vegetables show a distinct preference for crushed and cube varieties with every prospect for a continuance of this trend.

Manufactured ice prices to the dealer trade is said to be too low by those interested in selling this trade, but there is the prospect that quotations will be restored to somewhere near the levels of 1950.

Trade to railways, hotels and large handlers of imported food merchandise is reported very satisfactory. Quotations to railways are round the $5.50 to $5.75 per ton mark, while to hotels and others in this category, $6.00 a ton prevails. Deliveries to these markets were very much better in 1951 than in the previous year, and should show increases this next spring and summer, said ice manufacturers.

The household trade is reported quite good this winter. This is said to be due to mild and spotty temperatures and the prospect of an earlier spring than usually is experienced in this latitude. Home refrigeration and Montreal's ice peddlers are mentioned by some ice plants as having cut into their trade to some extent but there is still a steady patronage to be got with near-future prospects good for an active early summer trade.

On all grades of crushed and cube ice, extensive advertising by icemen at trade fairs and in the daily press are bringing results in a more general use in the homes as well as by the smaller food, butcher and fish shops. Manufacturers and ice dealers note continued preference over the past fifteen years for these types as natural ice becomes scarcer and the process of ice-harvesting becomes more costly from the labor angle.

Large wholesalers likewise are benefitting from advertising programs in which the more extensive use of ice is stressed, and while peddlers continue to take away some of the sale margin on house-to-house deliveries, prospects for 1952 appear to be favorable for an active trade.

In a summary of the ice situation, prospects are reported as very good for 1952, especially for the ice manufacturer as there will be considerable falling off of natural ice tonnage to enter the competitive market due to the continued mild weather. Prices too, for the usual 25 pounds a day to the average Montreal householder, are slated for an increase in the coming season from the current 13 cents. This, with the fact that only two natural ice companies of the six last year will be in the market should give the manufacturer a wide margin in competitive marketing.

All signs point to ice manufacturers running at full time for the months ahead with ice going into storage for later demands and the approaching season has every prospect of being a good one.

Sales and Reorganizations

Denver, Colo.—The Denver Ice & Cold Storage company, formerly owned by a Chicago firm, has been purchased by a group of Denver men and will be operated under the name of the Denver Crystal Ice Company. Henry Nadorf will remain as president of the company. Frank Adams, president of the Colorado Ice & Cold Storage Co., is a stockholder in the Denver Crystal Ice Co.

Frankfort, Ind. — Wallace Irwin, manager and co-owner of the Gem City Beverage Company, has taken over the operation of the Frankfort Ice and Coal Company. In announcing the change in management, Irwin said that under the new set-up, ice will not be manufactured at the plant, but the new owner will be the local representative of the Lafayette Ice Company and ice will be distributed here as in the past. In the future, the new owner plans city-wide delivery service; plans also include providing customers with a line of ice cubes and crushed ice.

Pratt, Kans.—Harry H. Bettis, for nearly 19 years manager of the Western Light and Telephone Co. ice plant here, has purchased WLT-owned ice properties here and in ten other western Kansas towns. Bettis announced the Pratt plant will be operated under the name of Bettis Ice Co. serving surrounding towns as well as the local trade. The plant has a capacity of 60 tons per day and is considered one of the most completely equipped in Kansas.

Seattle, Wash. — The Whiz Fish Products Co. of Seattle has purchased the large cold storage plant and cannery of the Sebastian Stuart Fish Co. in Alaska.

CONVENTION CALENDAR

NATIONAL ASSOCIATION FROZEN FOOD PACKERS

March 3-7, 1952
Conrad Hilton Hotel, Chicago, Ill.
L. S. MARTIN, Secretary

NORTH CAROLINA ICE ASSOCIATION

March 10-11, 1952
Hotel Sir Walter, Raleigh, N. C.
LEWIS H. POWELL, Secy.-Treas.

SOUTHWESTERN ICE MANUFACTURERS' ASSN.

March 12-14, 1952
Hotel Texas, Fort Worth, Texas
P. A. WEATHERRED, Secy-Counsel

PACIFIC DAIRY AND POULTRY ASSOCIATION

March 15-18, 1952
Hotel del Coronado, Coronado Beach, Calif.
RUNE F. GORANSON, Exec. Secy.

ILLINOIS ASSOCIATION OF ICE INDUSTRIES

March 20-21, 1952
Leland Hotel, Springfield, Ill.
WM. D. WRIGHT, Secretary

VIRGINIA ICE MANUFACTURERS ASSOCIATION

March 20-21, 1952
George Mason Hotel, Alexandria, Va.
H. H. SNYDER, Secretary

EASTERN STATES ICE ASSOCIATION

March 20-21, 1952
George Mason Hotel, Alexandria, Va.
SAMUEL FREER, Secretary

NEW ENGLAND ICE ASSOCIATION

March 27, 1952
Kenmore Hotel, Boston, Mass.
RAYMOND T. WILBER, Secretary

NORTHWEST ASSOCIATION OF ICE INDUSTRIES

March 26-28, 1952
Chinook Hotel, Yakima, Wash.
L. F. MARSH, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES

April 1-3, 1952
French Lick Springs Hotel
ROBT. W. WALTON, Secretary

THE REFRIGERATION RESEARCH FOUNDATION

May 2-4, 1952
Roosevelt Hotel, New Orleans, La.
H. C. DIEHL, Director

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES

May 5-8, 1952
Roosevelt Hotel, New Orleans, La.
WM. DALTON, Executive Vice-Pres.

AMERICAN WAREHOUSEMEN'S ASSOCIATION

May 5-8, 1952
Roosevelt Hotel, New Orleans La.
WM. DALTON, Executive Vice-Pres.

Studies on Frozen Cooked Sweet Potatoes

A PROGRESS report has been made on studies with various sugars, orange juice and water used in glazes for frozen cooked sweet potatoes, conducted by Beatrice Mountjoy and Mary Kirkpatrick of Bureau of Human Nutrition and Home Economics, USDA, Washington, D. C. The brown sugar with orange juice maintained the best color and was one of two glazes that protected flavor best. The other was brown sugar and ordinary sugar with no orange juice. In samples glazed with corn sirup, there was less darkening. All samples showed some decline in flavor during storage.

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NEW PLANTS and IMPROVEMENTS

This Department each month presents the more important developments covering new constructions, as well as additions, improvements, remodeling, and installations of new equipment in ice and cold storage plants and other industrial plants that use refrigeration. News notes on all such new constructions and improvements are invited.

California

Escondido, Calif.—Talone Packing Company has added a new holding room to its plant on Washington Avenue and the Railroad that will increase its beef and veal packing capacity by 300,000 pounds a month. The new holding room is built onto the packing house on the south side, 50 feet long, 33 feet wide and 15 feet high and has fibre glass in its walls and cork on the floor for insulation. The firm is owned and managed by Henry J. Talone and Mario P. Talone, brothers. Talone's is the largest of five independent meat packers in San Diego County, with a gross volume exceeding five million dollars for 1951. Only the Cudahy company at San Diego is larger.

Sacramento, Calif.—The California Almond Growers Exchange has recently completed the construction of a concrete and steel cold storage building for the storage of almonds at Sacramento, Calif. Associated Refrigerating Engineers of Los Angeles were the contractors for the building and machinery which cost approximately $300,000.

Florida

Wildwood, Fla.—The Royal Palm Ice Company here, second largest of the Royal Palm plants in the Southeast, is launching an expansion and reconditioning program, adding a 7000 ton ice storage plant, according to O. O. Roth, chief engineer of the plants. The new addition, which will be made of concrete blocks, double wall with reinforced steel, will be 70 feet in width, 114 feet long and 68 feet high.

Israel

Nathanya, Israel—An ice plant to form part of the $1,500,000 Israel National Brewery Ltd., is now being built, according to Louis Hertzberg, president of Metropolis Brewery of New Jersey and chairman of Old Dutch Brewery South Africa, Ltd.

Kansas

Leavenworth, Kans. — The meat packing plant which has been idle for more than two years, is now operating again under new ownership. The plant, a subsidiary of the Luer Packing Company of Los Angeles, was recently purchased by a group headed by J. S. Lasaine of Waukegan, Ill., and A. L. Morris of Chicago, the latter a one-time operator of the plant. It will continue under the name of Sunflower Meat Packing Co., Inc.

Mexico

Mexico City, Mexico — A newly formed company, the Tropic-Fresh Brands, has leased a modern quick-freezing and refrigeration plant with a capacity of 15 tons per day and holding rooms with a capacity of 200 tons. This company will pack frozen pineapple and strawberries for export to the United States. Specializing in pineapple chunks, whole and sliced, and strawberries packed in the 16 oz. size, the company hopes to export one million one-pound containers of each item. To conform with U. S. food and drug regulations the product will be packed under continuous Board of Health inspection and shipped under refrigerated conditions to El Paso, Laredo and Brownsville, Tex.

New York

Buffalo, N. Y.—City Ice & Fuel, 501 Amherst Street, has filed plans with the city to erect a boiler house at a cost of $3,000.

Texas

Pecos, Tex. — Community Public Service Co. is now operating a new S & S ice vending station.

San Antonio, Tex.—Lackland Air Force Base's new cold storage plant, with a capacity of 285,000 pounds of chilled and frozen foodstuffs, is now in operation. The plant, adjacent to the central meat cutting facilities, has two rooms. One 16 x 20 feet will contain butter, oleo and cheese and will have a storage capacity of about 85,000 pounds. The temperature will be 35 degrees. The second room is 40x60 feet and has storage space for 200,000 pounds of frozen foods.

Virginia

Potomac Yard, Va. — Mutual Ice Company of this city has established another S & S ice vending station.

Washington

Tacoma, Wash.—Columbia Breweries, Inc. has expanded and modernized their plant using Vilter refrigeration machinery. Much new refrigeration equipment was required for the vast refrigeration processes in brewing and cold facilities for the aging of both ale and beer products. The brewery has expanded from two ammonia compressors of fifty tons some years ago to the present six compressors of 400 tons and air conditioning of fermenting and aging rooms with most modern refrigeration throughout the cold cellars. W. E. Stone & Co. Inc., refrigeration engineers, handled the project.

Fires and Accidents

Sonoma, Calif.—The 40-year old Sonoma Ice and Brewing Co. building on East Second Street was almost destroyed by fire. It had recently been used by a mushroom growing business operated by Floyd Love. The major portion of the structure is of stone and cement construction, however approximately two-thirds of the interior was badly damaged.

Aiken, S. C.—Fire of undetermined origin damaged the Southern Cities Ice plant here.

Champaign, Ill.—A building at 504 N. Market Street, formerly occupied by the Twin City Ice and Cold Storage company, was extensively damaged by fire recently. The blaze started in the condenser room in the northeast corner of the building and spread through the roof. The fire started from sparks from a blowtorch used to remove the ice-making equipment from the building.

Madisonville, Ky.—A fire destroyed the Acme Frozen Food Locker plant a mile from the city limits. W. S. Winstead, owner of the plant, said that the plant loss will probably be $40,000, with no insurance.

Hermiston, Ore.—The meat packing plant of Melvin Follett on Diagonal road in the Columbia district was destroyed by fire at a loss of $7,500. The fire left only three walls standing. The loss was partly covered by insurance.

Wenatchee, Wash. — The packing shed and main cold storage building of the J. M. Wade Fruit Company was destroyed by fire, estimated in excess of $600,000. Included in the loss were approximately 100 cars or 80,000 boxes of packed Red Delicious, Delicious and Winesap apples which alone represent around $350,000. The buildings, fruit and equipment were completely covered by insurance.

New Incorporation

Seattle, Wash.—The Seattle Frosted Foods Co. recently formed and incorporated here, with capital stock of $50,000 by Wilson A. Peterson, Harold D. Shaw, and Hulbert S. Murray, all of this city.

Natural Ice Harvest

Detroit Lakes, Minn.—With freezing temperatures providing ice 21 inches thick, two firms began the annual harvest the last of December of an estimated 75,000 tons of ice from Big Detroit Lake.

DEATHS

Gustave Charles Young

LONG associated with the cold storage and refrigeration field not only of Seattle, but of Puget Sound, Gustave Charles Young, for the past 16 years superintendent of cold storage for the Port of Seattle, died in Seattle this January after a brief illness. Born in Sweden, he came to the United States in 1889, and to Seattle in 1930. Besides his widow, Ethel, at the family home in Seattle, 7510 Roosevelt Way, he leaves two sons, Capt. Robert W. Young of the USAF stationed in New Mexico, and Gordon C. Young of Conception, Chile.

Collin M. Selph

THE death of Collin M. Selph, Richmond, Va., president of the Virginia Ice Machine Corp., occurred January 8 at a Richmond hospital. Mr. Selph had made his home in Richmond most of his life.

In 1929, he and his son, Orris, organized the ice machine concern and he served as president until his death. Previously he was secretary-treasurer of the Southern Asbestos Manufacturing Co., in Richmond. He was a member of Richmond Lodge, No. 10 AF&M, a member and past master of Tuckhoe Lodge, No. 347, and a member of the Richmond Lions Club, Dalcho Consistory No. 1, Valley of Richmond, and Acca Temple Shrine.

Surviving are his widow, Mrs. Ella Mull Selph and son, Orris Selph.

Charles W. Griesser

THE death of Charles W. Griesser, owner of the Polar Ice and Supply Company, Joplin, Mo., widely known businessman and an ardent sportsman occurred in his sleep February 12 in the University of Kansas medical center at Kansas City, Kans., where he had been a patient two weeks. He was 65 years old. Mr. Griesser was born in St. Louis and came to Joplin in 1905 from El Paso, Tex., to manage the Home Brewery & Ice Co. for his uncle, Wilhelm Griesser. With his uncle, he operated this company until 1919, when he organized the Polar Ice and Supply Company, which he operated since that time.

Herman W. Lyendecker

THE death of Herman W. Lyendecker, secretary-treasurer of the Haddon Ice & Coal Co., Haddonfield, N. J., occurred Tuesday, January 15. Although he had been ill for some time his passing was a shock to his friends and business associates. He was an active member of both ice and refrigerated warehouse associations and had served as an officer of local ice associations.

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Minnesota
Minneapolis....AT-4501-8
South St. Paul....LaSalle 6481
St. Paul....GA 4351-6
Missouri
South St. Joseph....8-0661
St. Louis....Main 3600
Nebraska
South Omaha....Market 5400
New Jersey
Passaic....Prescott 7-0300
Patterson...Sherwood 2-8040-1-2-3-4
New York
Brooklyn....EV 7-3900
Buffalo....MA 1413
Rochester....Locust 3570
Syracuse....76-5391
Yonkers....Y-5-4422-3-4
Lorraine 2-9714
North Carolina
Charlotte....3-5152-3-4
Ohio
Cleveland....Endicott 1-1160
Columbus....Garfield 2161
Toledo....Adams 9131
Oklahoma
Oklahoma City....79-2551
Tulsa....37151-2-3
Oregon
Portland....Twinoaks 1151
Pennsylvania
Philadelphia....Poplar 5-0100
Pittburgh....Hemlock 1-1200
Pittsburgh Prov. & Packing Co....GR 1-2460
Rhode Island
Providence....EL 1-1400
Tennessee
Chattanooga....6-4725
Knoxville....3 5135-6
Memphis....5-4311
Texas
Amarillo....6-5246
Corpus Christi....6-5246
Dallas....Randolph 5901
El Paso....3-3621
Fort Worth....Market 2101
Harlingen....2050
Houston....Capitol 1175-5
San Antonio....Garfield 5321
Virginia
Richmond....3-1876
Roanoke....7751-2-3
South Norfolk....66-2441
Washington
Spokane....Lakeview 1541
West Virginia
Charleston....27-165
Wisconsin
Milwaukee....MA 8-6200

AGENTS

Indiana
Indianapolis: A. Hoffman Co.
State Life Building....Market 8666
Kansas
Wichita: Thompson-Hayward Co.
727 E. Osie St....5-9606
Tennessee
Nashville: Sanders, Inc.
712 8th Ave., S....6-7111

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What's New

MACHINERY
APPLIANCES • PROCESSES

Permamix New Floor Patching Material

A NEW floor patching material called Permamix, claimed to incorporate many new features not included in any other similar product now on the market, is now ready for distribution by the Permamix Corporation, 228 N. LaSalle St., Chicago. It is a product of laboratory research and development, tested and proven over a three year period under actual plant and floor maintenance service conditions, and is not to be confused with ordinary premixes now available.

Permamix can be used on any present type flooring, it is ready for instant use, indoors or out, just as it comes from the container. There is nothing to add, nothing to mix, it will not freeze, it can be stored indefinitely and used in any temperature. It sets instantly, traffic can be resumed immediately. There is no danger of temperature damage to the patched area. It comes in handy, durable 50 lb. net weight drums.

It is especially adaptable to low temperature rooms in refrigerated warehouses or frozen food storages, because it works just as easily in below zero temperatures as in normal temperatures, an important point because it insures that there will be no danger of damage to the patch by freezing; also it is not necessary to turn off the refrigeration before applying the patching material. It also is adaptable to outdoor loading docks, pavements, or other trucking areas.

Ease of application is one of its main advantages. There are three simple steps to follow: first clean hole to be patched and spread primer supplied in drum, second, fill in with Permamix, and third, tamp solidly and dust with cement or floor dust. If these directions are followed traffic may be resumed immediately.

Worthington Announces Transfer Unit for Ammonia

A NEW LPG-A transfer unit to transfer anhydrous ammonia from tank car to storage tank is announced by Worthington Pump and Machinery Corp., Harrison, N. J. The unit not only transfers the ammonia but also the residual vapors left in the tank car after it is emptied of liquid. These residual vapors represent from 800 to 1200 gallons which are often left in the car.

The transfer unit is a compact, self-contained assembly comprising compressor, motor, motor starting switch, suction surge drum, oil filler pot, combined discharge drum with relief valve and oil separator with automatic return, 4 way valve, suction and discharge pressure gauges, Multi-V-Belt drive and belt guard, all mounted on base ready for installation.

The compressor is designed specifically for compressing gases. Cyl-

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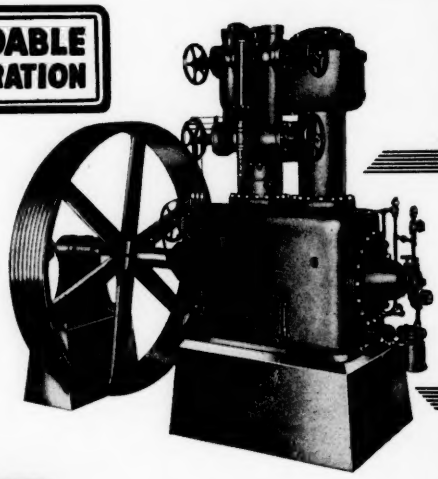
GET READY NOW FOR SUMMER!

Now is the time to check your equipment for the summer season . . . if you need additions, replacements or repairs to your present refrigerating system, or a complete new plant—remember, more than 50 years of STERLING superiority are at your service. Contact your nearest STERLING distributor . . . he can make immediate delivery on most models of STERLING equipment.



REYNOLDS MANUFACTURING CO.
SPRINGFIELD · · · MISSOURI.

MOST MODELS ARE AVAILABLE FOR IMMEDIATE DELIVERY

DAVOUX
INSULATED COVERS

PROTECTION . . .
QUALITY . . .
SERVICE
FOR THE ICE INDUSTRY

NO SHIFTING NO WADDING
20 SIZES

C. R. DANIELS, INC.

METAL BOTTOM ICE BAGS

INSULATED COVERS

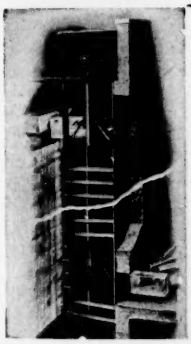
WATERPROOF TARPS

75 West St., New York 6. N. Y. 549 W. Randolph St., Chicago 6, Ill. 121 E. Third St., Charlotte 2, N. C.

THE INDEX LINE
ICE DEALERS SUPPLIES

Only the Highest Quality Merchandise and efficient service necessary for the proper and profitable operation of your business. Write for our 1951 catalog.

INDEX COUPON AND SUPPLY COMPANY
LA PORTE, INDIANA



CEMCO

Double Gig Ice Hoist
Fast - Sturdy -
Dependable -

Send for details

THE CAPITAL ELEVATOR & MFG. CO.
424 W. Town St.
Columbus 8, Ohio

The Book of Refrigeration Knowledge

Basic Refrigeration

PRINCIPLES
PRACTICE
OPERATION

By GUY R. KING
Refrigeration Instructor
Santa Monica Vocational School

$6.00 POST PAID

THE 29 chapters of this 500-page book contain a complete and simplified presentation of the fundamentals of refrigeration, giving equal treatment to all common refrigerants, design, operation and servicing of the apparatus and systems.

The author has drawn on a wide and varied experience in the practical aspects of refrigeration, coupled with many years of teaching the subject. BASIC REFRIGERATION is written in non-technical language and the author has recognized the requirements of the refrigeration engineer, installer, salesman, student and instructor, compiling the text in a manner which progressively treats the subject from fundamentals to complete systems.

The text is supplemented by an unusually large number of excellent illustrations, (348). All basic points are graphically illustrated in a way that creates additional interest for the reader and assists him to gain a full understanding.

Numerous example problems are given along with a step by step solution. Each chapter is followed by a good group of questions.

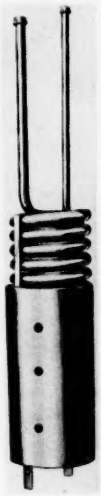
NICKERSON & COLLINS COMPANY
433 N. Waller Ave. CHICAGO 44, ILL.

inders and crankcase are one integral casting eliminating gasketed faces between crankcase and cylinder which are vulnerable to leakage of gas. A mechanical packless seal on the shaft retains gas within the crankcase. With crankcase-to-cylinder gaskets eliminated, there is no need to reduce the suction pressure of the gas coming to the compressor since it can readily withstand 250 psig pressure on the suction side. No unloading for starting is required.

The ability of the Worthington Compressor to utilize at its suction, the full vapor pressure of anhydrous ammonia at any ambient temperature up to 115° F provides a very substantial advantage. This is because the capacity of any compressor in terms of the weight of the gas handled varies directly in proportion to the absolute suction pressure. Consequently, the Worthington Compressor will pump twice as many pounds of gas at 200 pounds suction pressure as would be the case if the suction pressure were reduced to 100 pounds.

Worthington Bulletin H-609-B1 describes the unit and includes graphs of the residual vapor left in a 10,000 gallon tank car at different ambient temperatures. Specifications, schematic layout of the unit, and discussions of lubrications system, pressure gauges, suction surge drum and base are included. Copies of this bulletin are available upon receipt of a request on company letterhead.

Bulk Storeage Preheater



A NEW model of the line of "Hot Spot" preheaters for 14½ inch manholes of bulk storage tanks has been announced by the Rempe Company, Chicago, Ill. Previous models were for manholes 16½ inch and larger. This preheater is an all-steel shell and coil assembly that is inserted into a bulk storage tank for preheating oil and other liquids before they enter the suction line. The "Hot Spot" rests on the bottom of the tank. Suction pipe and inlet and outlet pipes for heat, either steam or hot water, go through the manhole cover.

A special flow accumulator causes the heavy oils or other liquids to flow over heated pipes before entering the suction line. In this way liquids are heated to proper flow temperature. Load is taken off the suction pump. Proper length inlet and outlet pipes to fit any diameter tank are furnished. Unit is completely tested with 400 lbs air pressure under water after fabrication.

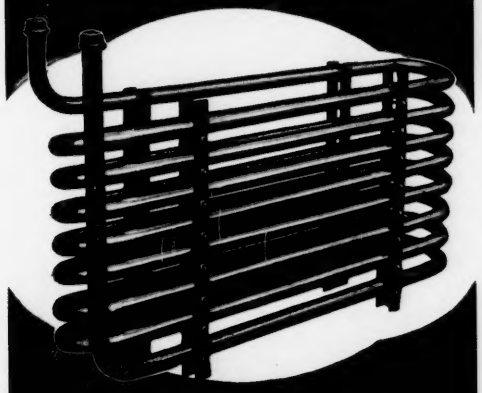
Complete information may be had by addressing the manufacturer, Rempe Co., 340 N. Sacramento Blvd., Chicago 12, Ill.

Truck-Trailer Cooler

A NEW cooling unit provides even temperatures, with a minimum loss of humidity for perishable cargoes in trucks and trailers. The manufacturer claims the pressure valve control from which the cooler operates represents an advantage over the conventional system which relies on thermostatic expansion control. This feature is said to provide a continuous flow of refrigerated air within 10 F of the temperature of the air circulating over the coils so that the amount of humidity taken from the air is negligible. Thus the temperature fluctuations and readings resulting from intermittent operation of thermostatically controlled coolers are eliminated. The equipment also features a load limiting valve which maintains suction back pressure and is adjustable to suit a compressor and gasoline engine combination. This valve prevents both engine overloading on starting and extremely high head pressures by automatically throttling excessive refrigerated gas pressure.

Coils

Smooth Bends
Perfect Welds
Exact Measurements

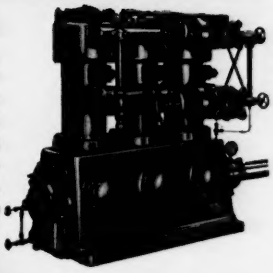


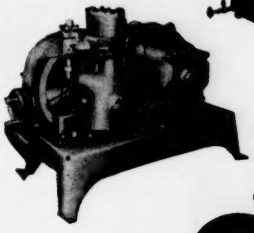
For over sixty years, the National Pipe Bending Coils have proved their quality in Ice and Refrigeration plants

IN REFRIGERATION
it's All in knowing
HOWE

STANDARD AMMONIA COMPRESSORS in sizes to 150 ton. For that difficult two temperature job, use Howe Multiple Effect type compressor and save in first cost, power cost, installation and maintenance.

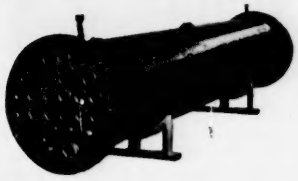
A size and type for every job!

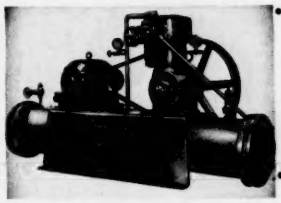




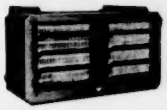
FREON-METHYL CONDENSING UNITS

SHELL AND TUBE CONDENSERS AND EVAPORATIVE CONDENSERS





FULL AUTOMATIC AMMONIA COMPACT UNITS



DOUBLE FAN UNIT COOLER

POLAR CIRCLE COILS

Write for illustrated catalog.

HOWE ICE MACHINE CO.
2829 Montrose Ave., Chgo 18 Cable: HIMCO, Chicago

New Rubber Door For Refrigerated Warehouses

A SWINGING rubber door, so light and flexible it can be bent to a right angle, has been developed to replace heavy wooden doors in cold storage warehouses. Oliver C. Eckel is designer of the door and president of the Stic-Klip Manufacturing Co., where it is now in production.

"The new door will eliminate the costly maintenance and damaging of conventional wooden doors caused by power trucks banging into the doors to open them," Mr. Eckel said. The rubber door, which swings open at a touch absorbs the shock of the trucks, gives maximum ease of passage, and returns to its normal closed position.

Actually a reinforced rubber air container, Mr. Eckel explained, the door is constructed of an outer layer of heavy cloth inserted rubber which covers a "frame" of 2-inch rubber tubing. Support and resiliency are provided by 15 to 25 inflated rubber bladders specially designed and manufactured by Dewey and Almy Chemical Co., Cambridge. These bladders, running cross-wise inside the rubber facing, are positioned between rubber spacers, and are inflated by hand pump through protruding valves.

The new flexible rubber swinging door is made by Stic-Klip Mfg. Co.

Though the door is only 2½ inches thick, it has high insulation value, Mr. Eckel stated, a smooth outside surface and so little inertia that the pressure of one finger opens it. Extremely light weight compared to metal protected wooden doors, it is suspended on hinges attached to steel strips running along one side.

Automatic Door Operator

AN AUTOMATIC door operator for industrial applications employs a balanced high frequency electrical system with a floor installed antenna. Unbalancing of the field by a person passing over the antenna actuates the operating equipment and opens the door. The door stays open to allow safe clearance and then closes automatically. Speed of the door is checked to avoid slamming. Opening and closing are performed by air pressure, and timing is adjustable to individual requirements. It controls all types of sliding, swinging, or folding doors and is prepiped and prewired for easy installation.

Advantages listed by the manufacturer are easy installation; precise, low maintenance operation; positive action opening and closing; clear approaches and doorways; and low cost. It is claimed to be particularly applicable for use in plants where temperature and humidity control are important factors.

Easier and Cheaper with

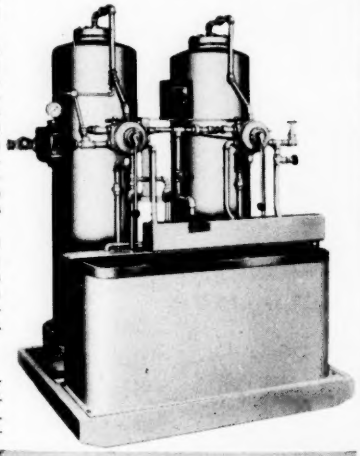
INDUSTRIAL Water Demineralizer

It's worth looking into . . .

The demineralization of water is not something new. It is used in the food industry, in the chemical and other industrial processing where chemically pure water is used in quantity. The very low cost warrants your looking into it.

Here are some of the advantages you get with an INDUSTRIAL demineralizer in ice making. Since the dissolved mineral salts in ordinary water are removed in passing through the ion-exchange resins, core-water removal and replacement is unnecessary. Losses due to cracking are greatly reduced. Freezing at the lower brine temperature increases daily yield. And the bulk of the cake of ice is clearer—your customers will notice that.

If you will send us an analysis of the water you are using, the quantity you need, and at what rate (gallons per hour) we will send you information on INDUSTRIAL demineralizers, estimate of costs, performance data, etc. Better do it now.



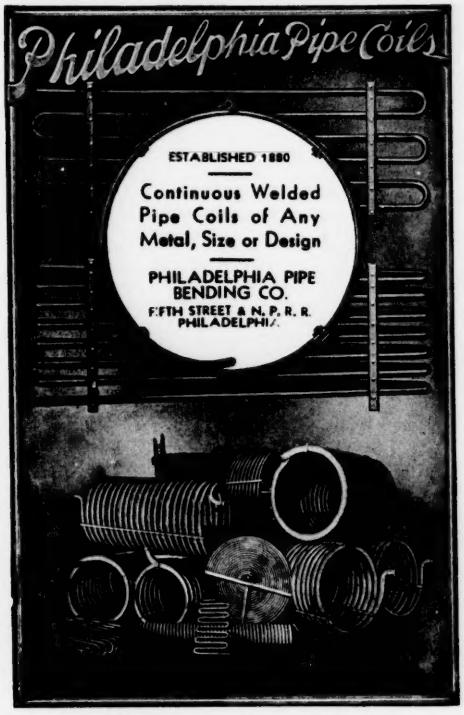
A typical two-bed INDUSTRIAL Water Demineralizer. Standard models available with capacities up to 1000 gph. Special units of any capacity engineered to requirements.

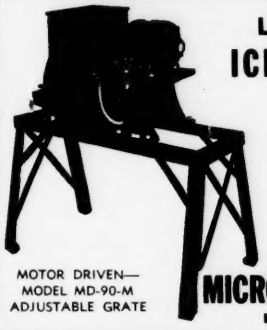
FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog • Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

5914 Ogden Avenue
Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS


Philadelphia Pipe Coils
ESTABLISHED 1880
Continuous Welded Pipe Coils of Any Metal, Size or Design
PHILADELPHIA PIPE BENDING CO.
FIFTH STREET & N. P. R. R.
PHILADELPHIA



MOTOR DRIVEN—
MODEL MD-90-M
ADJUSTABLE GRATE

LITTLE GIANT
ICE BREAKERS

- SAVE TIME
- SAVE LABOR
- SAVE ICE

11 MODELS TO CHOOSE FROM

Write for descriptive circular

MICRON, INC., Dept. I
BETTENDORF, IOWA

USED ICE MACHINES & EQUIPMENT

- COMPRESSORS—with or without MOTORS
- COMPRESSORS—Diesel or Steam driven
- COMPLETE ICE PLANTS—15 to 50 Tons
- CONDENSERS—TRAVELING CRANES—PIPE — ICE CANS — NEW and Used

Write or call for complete list of new and reconditioned ice making equipment.

ROBERT P. KEHOE MACHINERY CO., INC.
278 W. Englewood Ave. West Englewood, N. J.
TEaneck 7-3916

Welded Cans
Integral Tube Cans
Arctic Pownall Cans
Can Baskets
Condenser Trough

Industrial Trucks and Trailers

THE OHIO GALVANIZING & MFG. CO.
NILES OHIO

MANUFACTURERS' NEWS

S. E. Lauer Re-elected President of York Corp.

DURING the annual meeting of the York Corp. Board of Directors, held in York, Pa. recently, Stewart E. Lauer was re-elected president of the corporation. Mr. Lauer was first elected president of the air conditioning and refrigeration firm in 1940.

At the same session the following officers were re-elected: J. Keith Louden, vice-president and assistant to the president; John G. Bergdoll, Jr., vice-president and production manager; John R. Hertzler, vice-president and general sales manager; Rodney F. Lauer, vice-president, engineering and research; Donald M. Magor, vice-president and controller; Marshall G. Munce, vice president, trade relations; and William F. Lynne, secretary and treasurer. Charles A. Barnes was re-appointed assistant secretary and assistant treasurer while Carl W. Fenninger, Jr., was renamed assistant secretary.

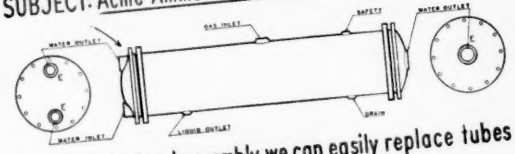
At the annual meeting of the stockholders held prior to the meeting of the board of directors, Carl W. Fenninger, director of the Provident Trust Co., Philadelphia; John R. Hertzler and J. Keith Louden, vice-presidents were re-elected directors to serve for three years. William J. Meinel, president of the Heintz Manufacturing Company was re-named a director for a term of two years. Richard T. Nalle, president of the Midvale Co., was re-elected director for a period of one year.

Other directors are: Stewart E. Lauer, Philip H. Glatfelter, president and treasurer of the P. H. Glatfelter Co.; William J. Kelly of the William Kelly & Co.; Elmer A. Kleinschmidt, former executive vice-president and now consultant to the York Corporation; George S. Munson, partner in the law firm of Townsend, Elliott and Munson; and Robert W. Wolcott, chairman of the board of Lukens Steel Company.

Pages from an ENGINEER'S NOTEBOOK

MEMO: Purchasing Dept.

SUBJECT: Acme Ammonia Condensers



1. With the lock nut assembly we can easily replace tubes ourselves, when necessary.
2. Refrigerant connections are of forged steel—insures longer wear.
3. Shells are of seamless steel pipe. Wall thickness varies with the diameter. Should last a lifetime.
4. All condensers are designed constructed and tested to meet A.S.M.E. requirements.
5. Large variety of models and head combinations make possible the exact selection for a particular need.

RECOMMEND WE SPECIFY ACME INC.

MEN who know always specify Acme

In the air conditioning and refrigeration business the men who are really in a position to investigate a product and its capabilities ultimately choose Acme units to fill their cooling needs. Acme has been in the business since 1919 and in that time has developed a complete line of top quality products. Write a letter today for a custom-made product to fill your needs.

Address Dept. IR

ACME INDUSTRIES, INC., Jackson, Mich.

AIR CONDITIONING and REFRIGERATION DIVISION

Continuously serving the air conditioning and refrigeration industry since 1919

Acme Industries Opens New Branches

ACME INDUSTRIES, INC., Jackson, Mich., announces the opening of two new branches in Cambridge, Mass., and in Portland, Maine. Fred W. Smith, former president of Baker Refrigeration Corp., has entered into a partnership with the Graham Refrigeration Products Company, Inc., Springfield, Mass. This latter firm is the New England agency for both Acme contractor products and products of its Flow-Cold Division. The two new outlets will also offer the complete line.

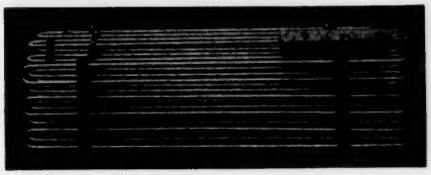
The headquarters of the agency will remain at 1694 Main Street, Springfield, Mass. Mr. Smith will direct the outlet at 52 First Street, Cambridge, Mass. Their Portland office will be at 402 Forest Avenue.

Roy Graham has been identified with the refrigeration and air conditioning business in New England for over twenty-five years with leading manufacturers and began his own business in 1940. Fred Smith also has a distinguished career having formerly been commercial sales manager for the Frigidaire Division of General Motors prior to 1942, when he went to Washington to head up the Refrigeration and Air Conditioning Branch of the War Production Board. After World War II, Fred Smith was product manager for Carrier Corporation. For the past two years, he has been with Baker Refrigeration Corporation but recently resigned as president of the company to enter his own business.

QUALITY COILS FOR ALL APPLICATIONS

WELDED HEADERS, PIPE BENDS AND AMMONIA RECEIVERS

Whether your next job be for a single bend, or coil or complete Piping system, Chicago Nipple can supply your requirements. Experienced workmen, practical engineers, and modern equipment reflect the quality of our products.



Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

SEND DRAWING OR BLUE PRINT FOR QUOTATION

CHICAGO NIPPLE MFG. CO.
1997 Clybourn Ave., Chicago 14, Ill.

EVAPORATOR PRESSURE CONTROLS

AMMONIA COMPRESSORS

Wolf Linde

Est 1880

FREON VALVES UP TO 12"

AMMONIA VALVES AND FITTINGS

Manufactured and Sold by

DERSCH, GESSWEIN & NEUERT, Inc.

4849 West Grand Avenue Chicago 39, Illinois

SERVING THE ICE INDUSTRY FOR 20 YEARS

Dependable . . Automatic . . Refrigerated

S&S ICE VENDING STATIONS AND ICE VENDING EQUIPMENT

Write, Phone or Wire for Full Details and Prices!

S&S Vending Machine Co.
670 LINCOLN AVE., SAN JOSE, CALIFORNIA

DIMCO CAST ALUMINUM FIN EVAPORATING COIL

★ *Saves Space*

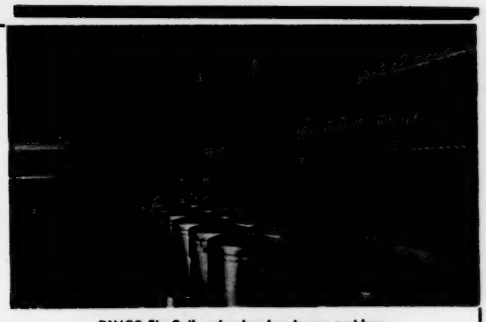
★ *Saves Weight*

★ *Saves Cost*

CAN BE USED WITH ANY REFRIGERANT

Manufactured by

DETROIT ICE MACHINE COMPANY
2615 Twelfth St., Detroit 16, Mich.



DIMCO Fin Coils solve low headroom problem
View of Mezzanine Lard Storage Room
Peters Sausage Company, Detroit, Mich.

Associated with Mr. Smith in the Acme Boston office will be Chester A. Garland who has also been with Baker Refrigeration for the past four years as assistant to the president.

C P Appoints Gillespie Buffalo Manager

Effective January 1, Dale Gillespie was appointed manager of the Buffalo, N. Y. branch of The Creamery Package Mfg. Company, according to an announcement from D. C. Lightner, Sales Manager.

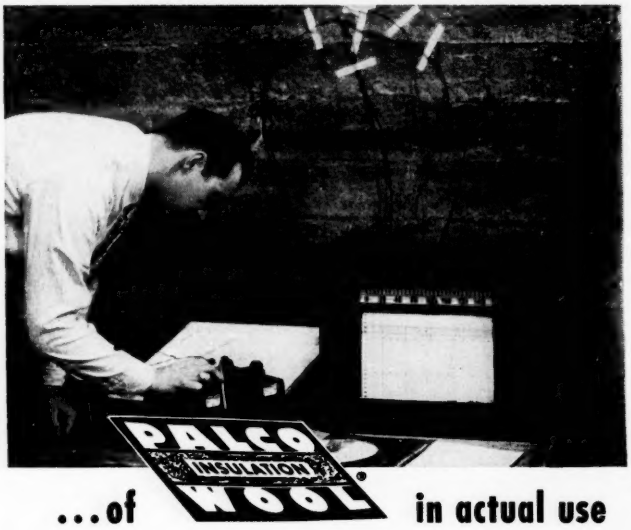
Mr. Gillespie graduated from Ohio State University in 1939 with a Degree in Dairy Technology, having also taken special training in Engineering. He joined the Research and Development Department of the Creamery Package Mfg. Company in 1939 with headquarters in Chicago. He was later transferred to CP's Atlanta Branch where he served as sales engineer for several years. In 1942, he returned to the firm's general office where, in the capacity of general sales engineer, he engaged in general sales and special field engineering in all parts of the United States and Canada.

He is a member of American Dairy Science Association and American Society of Refrigeration Engineers, and is currently a member of the DISA Technical Committee, serving on several committees, including the

Dale Gillespie

DISA Task Force Committees on Plate Heat Exchangers and H.T.S.T. Pasteurizers.

NEW *In-Place* FIELD TESTS MEASURE INSULATION EFFICIENCY



...of in actual use

For the first time, newly developed scientific *in-place* tests now measure the installed efficiency of Palco Wool after many years' use. Conducted under actual operating conditions by independent refrigeration engineers, these impartial field tests provide invaluable factual data never before available from laboratory findings. Information developed from this continuing series of applicational tests opens up an entirely new concept of low-temperature insulation efficiency. Results of these *in-place* field tests are now available. To obtain this valuable data, request: Technical File No. IR-1

CERTIFIED INSULATION

THE PACIFIC LUMBER COMPANY
100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

CATALOGS AND BULLETINS

Application of Motors to Reciprocating Compressors

APPLICATION of direct-connected synchronous motors to reciprocating compressors is a reprint of a paper presented at the New York Section of A.I.E.E., Power & Industrial Division, Motor Selection and Application Course in December 1951. Written by G. L. Oscarson, Chief Application Engineer, Electric Machinery Mfg. Company, this discussion deals largely with consideration of proper rotor flywheel effect (WK^2) as a preventive measure for voltage fluctuations when driving reciprocating compressors with Direct-Connected Synchronous Motors. Examples complete with formulas, sample calculations, and reference curves are included in the booklet. A worthwhile addition to the engineers reference library, this 12 page technical article is available on request from Electric Machinery Mfg. Company, Minneapolis 13, Minn. Ask for Publication No. 1200-TEC-1111.

New Byers Booklet On Wrought Iron

AN ILLUSTRATED eight-page booklet "Proof by Performance" has been released by A. M. Byers Company, America's largest wrought iron manufacturer. The publication describes, in a non-technical manner, a number of installations in which wrought iron gave outstanding service over long periods of time. Copies of the booklet may be had by writing to A. M. Byers Co., Clark Building, Pittsburgh 22, Pa.

THE BUYERS DIRECTORY

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ABSORBERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

AIR AGITATING SYSTEMS AND FITTINGS
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AIR COMPRESSORS
Frick Co., Waynesboro, Pa.

AIR CONDITIONING EQUIPMENT
Carrier Corp., Syracuse, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.

AMMONIA COMPRESSORS
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Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA CONTROL DEVICES
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Kramer Trenton Co., Trenton, N. J.

AMMONIA FLOAT VALVES
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Phillips & Co., H. A., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA MANUFACTURERS
Armour Ammonia Div., Armour & Co., Chicago, Ill.
Bower Chemical Mfg. Co., Henry Philadelphia, Pa.
du Pont, Polychemicals Dept., Wilmington, Delaware

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Acme Protection Equipment Co., Chicago, Ill.

AMMONIA PURIFIERS
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Howe Ice Machine Co., Chicago, Ill.
International Salt Co. Inc., Scranton, Pa.
Vilter Mfg. Co., Milwaukee, Wisc.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA RECEIVERS
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Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

AMMONIA VALVES & FITTINGS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

ARCHITECTS AND ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

ASPHALT PRODUCTS
American Bitumuls & Asphalt Co. San Francisco, Calif.

AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.
Sporlan Valve Co., St. Louis, Mo.
Vilter Mfg. Co., Milwaukee, Wis.

BAGS, ICE
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Corp., New York, N. Y.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Co., New York, N. Y.

BEER COOLERS
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Penna.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
Frick Co., Waynesboro, Pa.
Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
Nickerson & Collins Co., Chicago, Ill.

BRINE CIRCULATORS
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Penna.
Reynolds Mfg. Co., Springfield, Mo.
Roots-Connersville Blower Corp., Connersville, Ky.

BRINE COOLERS
Acme Industries, Inc., Jackson, Mich.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

BRINE SPRAY COOLING
Acme Industries, Inc., Jackson, Mich.
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Penna.

(Buyers Directory continued on next page)

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"HUFF *and* PUFF"

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THE BUYERS

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BRINE TREATMENT
International Salt Co. Inc., Scranton, Pa.

CALCIUM CHLORIDE
Solvay Sales Div., Allied Chemical & Dye Corp., New York, N. Y.

CAN DUMPS
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Penna.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.

CANVAS COVERS
Daniels, Inc., C. R., Baltimore, Md.

CAR ICING EQUIPMENT
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

COILS
Acme Industries, Inc., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa.
Chicago Nipple Mfg. Co., Chicago, Ill.
Creamery Package Mfg. Co., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

COLD STORAGE CONSTRUCTION
Armstrong Cork Co., Lancaster, Pa
Frick Co., Waynesboro, Pa.

COLD STORAGE DOORS
Butcher Boy Cold Storage Door Co., Chicago, Ill.
Jamison Cold Stge. Door Co., Hagerstown, Md
Refrigeration Engineering Co., Montgomery, Minn.

COMPRESSORS
(See Ice Making and Refrigerating Machinery)

COMPRESSOR VALVE PLATES AND DISCS
Voss, Inc., J. H. H., New York, N.Y.

COMPRESSOR VALVES
Voss, Inc., J. H. H., New York, N.Y.

CONDENSERS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

CONSULTING ENGINEERS
Greene, Van R. H., New York, N. Y.
Ophuls & Associates, Fred, New York, N. Y.

CONTROLLNG INSTRUMENTS
Kramer Trenton Co., Trenton, N. J.
Taylor Instrument Companies, Rochester, New York

CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

COOLING TOWERS
Frick Co., Waynesboro, Pa.
Vilter Mfg. Co., Milwaukee, Wis.

CORK INSULATION
Armstrong Cork Co., Lancaster, Pa.

CORROSION CONTROL
Wright Chemical Corp., Chicago, Ill.

COUPON BOOKS
Index Coupon & Supply Co., La Porte, Ind.
Vivian Mfg. Co., St. Louis, Mo.

COVERINGS (PIPE AND BOILERS)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.

CYLINDERS (GAS & LIQUID)
Byers Co., A. M., Pittsburgh, Pa.

DEIONIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DEMINERALIZING EQUIPMENT
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.

DIP TANKS AND CAN BASKETS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Penna.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

DRIVES, TRANSMISSIONS
Frick Company, Waynesboro, Pa.

ELEVATING & CONVEYING MACHINERY
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.

ENGINEERS AND ARCHITECTS
(See Architects and Engineers)

EVAPORATORS
Acme Industries, Inc., Jackson, Mich.
Creamery Package Mfg. Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FEED-WATER HEATERS
National Pipe Bending Co., New Haven, Conn.
Vogt Machine Co., Henry, Louisville, Ky.

FIBERGLAS
Armstrong Cork Co., Lancaster, Pa.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.

DIRECTORY

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Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FILTERS, WATER
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Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.
Martocello & Co., Jos. A.,

FILTRATION EQUIPMENT
Industrial Filter & Pump Mfg. Co., Inc., Chicago, Ill.

FIN COILS
Acme Industries, Inc., Jackson, Mich
Howe Ice Machine Co., Chicago, Ill.
Rempe Company, Chicago, Ill.

FIRST AID SUPPLIES
Acme Protection Equipment Co., Chicago, Ill.

FITTINGS
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

FLOAT VALVES
Mojonnier Bros. Co., Chicago, Ill.

FLOOR PATCHING
Permamix Corp., Chicago, Ill.

FOOD FREEZING EQUIPMENT
Howe Ice Machine Co., Chicago, Ill.

FROZEN FOOD LOCKERS
Knickerbocker Stamping Co., Parkersburg, W. Va.

FUEL OIL PRE-HEATERS
National Pipe Bending Co., New Haven, Conn.
Rempe Company, Chicago, Ill.

HAND TRUCKS
Ohio Galvanizing & Mfg. Co., Niles, Ohio

HOISTING APPARATUS
Capital Elevator & Mfg. Co., Columbus, Ohio
Reynolds Mfg. Co., Springfield, Mo.

HYGROMETERS
Taylor Instrument Companies, Rochester, N. Y.

ICE BAGS
Union Bag & Paper Corp., New York, N. Y.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.

ICE CANS
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Penna.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Penna.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

ICE CHIPPERS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Penna.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
Frick Co., Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Jamison Cold Storage Door Co., Hagerstown, Md.
Martocello & Co., Jos. A., Philadelphia, Penna.

ICE CONVEYORS
Capital Elevator & Mfg. Co., Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Refrigeration Engineering Co., Montgomery, Minn.

ICE CREAM PLANTS
Frick Co., Waynesboro, Pa.

ICE CRUSHERS
Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Penna.
Micron, Inc., Bettendorf, Iowa
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBE CONTAINERS
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Union Bag & Paper Co., New York, N. Y.
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBERS
Vivian Mfg. Co., St. Louis, Mo.

ICE CUBING MACHINES
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc. Philadelphia, Pa.
Lilly Co., The, Memphis, Tenn.

ICE DELIVERY BAGS
Daniels, Inc., C. R., Baltimore, Md.
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Penna.
Union Bag & Paper Corp., New York, N. Y.
Vivian Mfg. Co., St. Louis, Mo.

ICE HARVESTING MACHINERY & TOOLS
Gifford-Wood Co., Hudson, N. Y.

ICE MAKING AND REFRIGERATING MACHINERY
Carrier Corp. Syracuse, N. Y.
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Penna.
Reynolds Mfg. Co., Springfield, Mo.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

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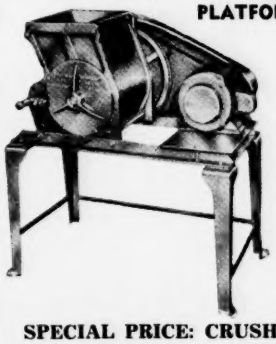
For Ice Station or Store

Model 25
PLATFORM CRUSHER



Bateman Crusher has four operating adjustments of the sizing grate that sizes ice from drug store to 1¾".
Hopper opening takes a 25-lb. block of ice.
The legs are 24 inches high, allowing a 25-lb. paper bag to rest under crusher. Has spout for filling paper bags.
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Due to drum and pick design, only a ¼ H.P. motor is required to operate this crusher.
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Bateman **Ice Processing Equipment**

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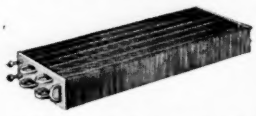

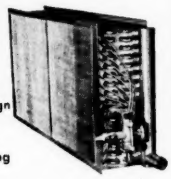

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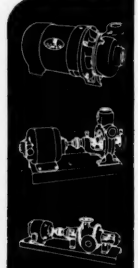

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AURORA PUMP COMPANY

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THE BUYERS

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Gifford-Wood Co., Hudson, N. Y.
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Martocello & Co., Jos. A., Philadelphia, Penna.
Vivian Mfg. Co., St. Louis, Mo.

ICE PICK SCABBARDS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Martocello & Co., Jos. A., Philadelphia, Penna.
Vivian Mfg. Co., St. Louis, Mo.

ICE PLANTS
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

ICE SCALES
Conveyor Co., The, Los Angeles, Calif.
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

ICE TOOLS
Gifford-Wood Co., Hudson, N. Y.
Ice Plant Equipment Co., Inc., Philadelphia, Pa.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Penna.

INDICATING INSTRUMENTS
Taylor Instrument Companies, Rochester, New York

ICE VENDORS
Frick Company, Waynesboro, Pa.
Jamison Cold Storage Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.

INSTANTANEOUS HEATERS
National Pipe Bending Co., New Haven, Conn.

INSULATING MATERIALS
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Armstrong Cork Co., Lancaster, Pa.
Pacific Lumber Co., San Francisco, Calif.

INSULATION ADHESIVES
American Bitumuls & Asphalt Co. San Francisco, Calif.

LOW TEMPERATURE EQUIPMENT
(See Ice Making and Refrigerating Machinery)

MAGNETIC FLOAT SWITCHES
Mojonnier Bros. Co., Chicago, Ill.

MASKA, AMMONIA
Acme Protection Equipment Co., Chicago, Ill.

MATERIALS HANDLING EQUIPMENT
Ohio Galvanizing & Mfg. Co., Niles, Ohio

OIL AND LUBRICANTS
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OIL SEPARATORS
King-Zeero Co., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.

OILS, CUTTING
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

OILS, FUEL
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.

PACKINGS
Frick Company, Waynesboro, Pa.
Vivian Mfg. Co., St. Louis, Mo.

PIPE COILS AND BENDS
Acme Industries, Inc., Jackson, Mich
Chicago Nipple Mfg. Co., Chicago, Ill.
Frick Company, Waynesboro, Pa.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PIPE WELDING
Acme Industries, Inc., Jackson, Mich
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

PIPING
Acme Industries, Inc., Jackson, Mich
Byers Co., A. M., Pittsburgh, Pa.
Frick Company, Waynesboro, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Rempe Company, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

PRESSURE BLOWERS
Martocello & Co., Jos. A., Philadelphia, Penna.
Roots-Connersville Blower Corp., Connersville, Ind.

PRESSURE REGULATORS
Taylor Instrument Companies, Rochester, N. Y.

PROPELLERS AND ROTARY PUMPS
Martocello & Co., Jos. A., Philadelphia, Penna.

PUMPING MACHINERY
Aurora Pump Co., Aurora, Ill.
Layne & Bowler, Inc., Memphis, Tenn.
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPING MACHINERY—AIR LIFT
Roots-Connersville Blower Corp., Connersville, Ind.

PUMPS, AMMONIA AND BRINE
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Roots-Connersville Blower Corp., Connersville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.

DIRECTORY

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Roots-Connersville Blower Corp., Connersville, Ind.

PURGERS
Armstrong Machine Works, Three Rivers, Mich.
Frick Company, Waynesboro, Pa.
Rex Engineering & Sales Co., Oklahoma City, Okla.

RAW WATER FREEZING SYSTEMS
Frick Co., Waynesboro, Pa.
Martocello & Co., Jos. A., Philadelphia, Penna.
Vogt Machine Co., Henry, Louisville, Ky.

REBOILERS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

RECORDING THERMOMETERS
Taylor Instrument Companies, Rochester, New York

REFRIGERATED ICE STATIONS
Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.

REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

RESPIRATORS
Acme Protection Equipment Co., Chicago, Ill.

RUST PREVENTATIVES
Bower Chemical Mfg. Co., Henry Philadelphia, Pa.
Wright Chemical Corp., Chicago, Ill.

SCORING MACHINES
Frick Company, Waynesboro, Pa.
Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Perfection Ice Scoring Machine Co., Fort Worth, Texas

SECOND HAND MACHINERY
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

SEPARATORS OIL, STEAM AND AMMONIA
Acme Industries, Inc., Jackson, Mich.
Frick Company, Waynesboro, Pa.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.

SHOULDER PADS
Gifford-Wood Co., Hudson, N. Y.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Bateman Foundry & Machine Co., Inc., Mineral Wells, Texas

Gifford-Wood Co., Hudson, N. Y.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

SPRAY NOZZLES
Martocello & Co., Jos. A., Philadelphia, Penna.

STORAGE HEATERS
National Pipe Bending Co., New Haven, Conn.

STRAINERS
Martocello & Co., Jos. A. Philadelphia, Pa.

TANKS
Frick Company, Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

TARPAULINS
Daniels, Inc., C. R., Baltimore, Md.
Index Coupon & Supply Co., La Porte, Ind.
Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

THERMOMETERS
Martocello & Co., Jos. A., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, New York

THERMOMETERS, RECORDING
Taylor Instrument Companies, Rochester, New York

TIERING MACHINES
Capital Elevator & Mfg. Co., The, Columbus, Ohio
Gifford-Wood Co., Hudson, N. Y.

TRAPS, OIL & STEAM
Armstrong Machine Works, Three Rivers, Mich.
Rex Engineering & Sales Co., Oklahoma City, Okla.

UNIT COOLERS
Acme Industries, Inc., Jackson, Mich.
Howe Ice Machine Co., Chicago, Ill.
Rempe Company, Chicago, Ill.

USED MACHINERY
Enterprise Equipment Corp., Yonkers, N. Y.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.

VALVES AND FITTINGS
Alco Valve Co., St. Louis, Mo.
Frick Company, Waynesboro, Pa.
Henry Valve Co., Chicago, Ill.
Kehoe Machinery Co., Inc., R. P., Ridgefield Park, N. J.
Martocello & Co., Jos. A., Philadelphia, Pa.
Phillips & Co., H. A., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

VALVES, COMPRESSOR
Voss, Inc., J. H. H., New York, N.Y.

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WATER TREATMENT MATERIALS
Industrial Filter & Pump Mfg. Co. Inc., Chicago, Ill.
International Salt Co. Inc., Scranton, Pa.
Wright Chemical Corp., Chicago, Ill.

WELDING
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Philadelphia Pipe Bending Co., Philadelphia, Pa.
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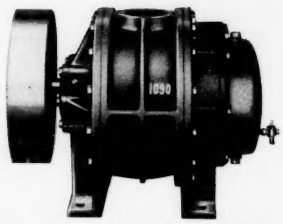

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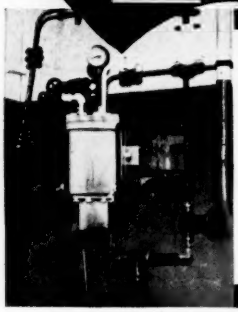

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Repeat orders like these are your best proof that Armstrong Purgers rid refrigerating systems of air and other non-condensables *and keep them that way.* Savings in power, work, water and refrigerant plus increased compressor capacity are the big benefits. Why not make them yours?

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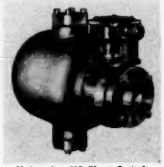
860 Maple St., Three Rivers, Michigan

ARMSTRONG Forged Steel PURGER

END LIQUID LEVEL MYSTERY



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Is your evaporator or accumulator an "iron curtain" hiding valuable inside operating information? There is no guessing with the Mojonnier MS Float Switch, because a built-in sight glass shows the refrigerant level at a glance. Fast trouble diagnosis saves time and money. ★ Switch works on a new magnetic principle. Operating parts in waterproof, transparent housing. Write for Bulletin 243.

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Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: $4.00 for 50 words or less; 70c for each additional 10 words or fraction thereof; $1 per line for bold face headings; $10.50 per inch for line listings.

POSITIONS AND HELP WANTED

POSITION WANTED — As chief refrigeration engineer or in a similar responsible position with a large plant or group of plants. Capable of handling the supervision of all operation, maintenance, remodeling and erection. Capable of keeping the operating costs at a minimum. I am 35 years of age, with 16 years experience in the industrial refrigeration field. Member of N.A.P.R.E. Have ability to get along with people and to handle men. References available upon request. Address Box FB-6, c/o Ice and Refrigeration.

POSITION WANTED—As warehouse manager or similar responsible position in public or private refrigerated and/or general merchandise warehouse. Thoroughly experienced in all office and operational procedures. Excellent references. Address Box MR-12, c/o Ice and Refrigeration.

NEW MAIL SERVICE—Log analysis, bid analysis, operating check-up, shrinkage control advise. Get the most for your power input; 35 years experience. Reasonable fee; honest and accurate. Strictly confidential. C. Clark Fisher, Refrigeration Consultant, P.O. Box 348, Huntington Park, Calif.

USED EQUIPMENT-wanted & for sale

FOR SALE—1 York compressor 11x13 direct connected to 150 synchronous motor 440 volts, 277 r.p.m. 1 York compressor 7½x7½ direct connected to 75 h.p. motor with capacitor 440 volts, 400 r.p.m. One Frick 8x8 V belt drive 40 h.p. motor, 440 volts, 250 r.p.m. 3 air compressors (1—6x9 Penn 220/440 20 h.p. motor, V belt drive. 1—6x9 Ingersall-Rand 220/440 15 h.p. motor, V belt drive. 1 New 9x12 Ingersoll-Rand 220/440 30 h.p. motor V belt drive.) One 50 h.p. ball bearing motor with capacitor 440, 360 r.p.m. 3 shell and tube condensers 14 ft. 130-100- 44 tubes. 1 electric tube cleaner. 1 Centrifugal pump 4" suction 4" outlet 10 h.p. 220/440 motor. 1 Two ton Euclid crane 34 ft. span 160 ft. 15" I beams. 25 new ice cans 11x22x52. Write Berkshire Sanitary Ice Co., Pittsfield, Mass.

FOR SALE—York Corp. V.S.A. ammonia compressors; one 6½x6½, one 7½x7½, one 8x8. Also two 7x5 Pennsylvania Pump Co. air compressors. Two 12x10 Union Steam Pump Co. air compressors. All machines with or without motors. Stock of good used ice cans, 300 & 400 lb. sizes. David Gordon, 1502 Indiana Ave., Chicago 5, Ill.

FOR SALE
ICE MAKING MACHINERY

1—6 cyl. 600 h.p. Atlas Diesel, 300 r.p.m.
1—4 cyl. 14x13½, York ammonia compressor.
2500—14 gauge ice cans, 11½"x22"x48".
Cranes, agitators, motors and pumps. Nearly new. Located in Brooklyn, New York.

Write Box MR-4
ICE AND REFRIGERATION

FOR SALE—One 60 ton York evaporative condenser. 3x3 self-contained York. 4x4, 5x5, 8x8, 9x9 Yorks, splash lubrication. One 10 ton horizontal brine cooler. Receivers, all sizes. One 8x8 new high speed Frick. One 4x4 self-contained Baker. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—F & E Model 300, completely automatic ice cuber. Takes 300 or 400 pound blocks. Excellent condition. Purchased new in 1947. Very reasonable price for immediate sale. Oscar Mayer ice Service, 910 Mayer Ave., Madison 1, Wisc.

FOR SALE—Many sizes rebuilt ammonia compressors, condensers, receivers, brine coolers; York trunk type freezing coil complete. Write us for details on other equipment you may need which is not listed. Parke Pettegrew & Son Co., 370 W. Broad St., Columbus 8, Ohio.

FOR SALE—ULINE scoring machine. Equipped with motor; A-1 condition. Handle up to 400 lb. blocks. Kasle Iron and Metal Inc., 1103 Lagrange St., Toledo 4, Ohio.

WANTED

Used automatic ice making equipment, in good condition, such as Vogt, Flake Ice, etc., ammonia refrigerant. Ten to fifty ton units. State size, make, age and price. Also compressors for above equipment. Address Box FB-8, c/o Ice and Refrigeration.

WANTED—Freezer coils, capacity about 30 tons, 2,500-5,000 sq. ft.; also condenser and large booster compressor. W. E. Bittinger Co., R. D. 3, Hanover, Penna.

ICE PLANTS—for sale

FOR SALE—18 ton ice manufacturing plant located in town of 1600 between Arkansas and Louisiana. Other industries in area are saw mills, oil fields and cattle and dairy business. Modern tile-block building, intended for use as meat curing and locker plant. Plant is electrically driven with cheap electricity. Terms may be had on part payment. Address Box MR-2, Ice and Refrigeration

FOR SALE—15 ton raw water electric power driven ice plant complete; now in operation, with good territory. County seat, 6150 population, has approximately 180 ton storage. Also a Culligan Soft Water Service route. Consumers Ice & Cold Storage Co., Mount Vernon, Indiana.

FOR SALE

1—50 ton Frick ice plant, 27 can pull, evaporative condensers; may be inspected in operation.
1—150 ton York ice plant, 13 can pull; equal to new.
1—12½x14½ York ammonia compressor 225 r.p.m.
1—11x13 York ammonia compressor 277 r.p.m.
1—10x10 York ammonia compressor 300 r.p.m.
1—8x8 York ammonia compressor 360 r.p.m., V-belt drive, 60 h.p. motor, capacity reducing valves.
1—100 h.p. G.E. synchronous motor with coupling.
1—7½x7½ York ammonia compressor, high speed, forced feed lubrication, V-belt drive.
1—York Economizer condenser.
1—16"x18' horizontal enclosed type condenser.
40,000 feet of 1¼" pipe.
Type 50 F & E cubing machine.

JOHN F. CARSON
2829 N. Broad St. Philadelphia 32, Pa.
Phone BAldwin 9-8549

FOR SALE—ICE PLANTS & EQUIPMENT

10 - 30 - 50 ton ice plants.
2—10x10 York ammonia compressors.
1—9x9 York ammonia compressor direct connected to a 75 h.p. synchronous motor.
1—7½x7½ York with 40 h.p. motors.
2—6½x6½ Yorks.
2—6x6 Fricks.
Self-contained units, sizes 5, 4 & 3, Yorks or Fricks.
Condensers, brine coolers, cranes, can dumps, fillers, valves & fittings, etc.
Send us your requirements on any equipment you may need.

B & E REFRIGERATING CO.
2 Orange St., Newark 2, N. J.
Phone: Mitchell 3-7790 Cable Address "BERECO"

FOR SALE — approximately 50 ton raw water, electric power driven ice plant, complete; now in operation, with good territory. No other ice plant in county of 40,000 population. This plant has approximately 700 tons ice storage. Terms can be arranged The Enterprise Ice & Coal Co., Harriman, Tenn.

FOR SALE — ICE PLANTS & EQUIPMENT

35-50-60-100 Ton Ice Plants—Immediate Sale
Ice Cans—11"x22"x47"—Excellent Condition
Ice Cans—11"x22"x51"—Excellent Condition
1—York 12¼"x14½" Ammonia Compressor High Speed.
1—Frick 12"x12" Ammonia Compressor direct connected to Diesel Engine—can be purchased without Diesel.
1—York 10"x10" Ammonia Compressor direct connected to synchronous motor 3/60/440 Speed 300.
1—York 10"x10" Ammonia Compressor direct connected to 100 HP synchronous motor 200 R.P.M.
1—York 10"x10" Ammonia Compressor 200 R.P.M.
1—York 10"x10" Ammonia Compressor High Speed.
Parts for York 10"x10" Cylinder Block, Top Heads, Pistons and Connecting Rod.
1—York 8"x8" Ammonia Compressor direct connected to 60 HP synchronous motor 327 R.P.M.
1—York 6½"x6½" Ammonia Compressor direct connected to 40 HP synchronous motor 360 R.P.M.
1—York 8"x8" Ammonia Compressor High Speed.
1—Frick 8"x8" Ammonia Compressor High Speed.
1—York 6½"x6½" Ammonia Compressor High Speed.
1—York 6"x6" Ammonia Compressor High Speed.
1—Frick 6"x6" Ammonia Compressor High Speed.
1—Voss 6"x6" Ammonia Compressor High Speed.
1—York 5"x5" Ammonia Compressor High Speed.
1—Frick 5"x5" Ammonia Compressor High Speed.
1—Frick 3"x3" Ammonia Compressor High Speed.
Can supply motors for all compressors.
Low Pressure blowers—all sizes.
Assorted sizes electric hoists and cranes ranging from 2 to 6 Ton capacity.
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1—Scoring Machine Perfection.
2—Sheppard Cranes 4 and 5 Ton capacities—3 motor jobs.
Brine Coolers, submerged shell and tube type.
1¼" and 2" Ammonia Coils, approximately 10,000 feet.
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The classified section is the market place of the industry. Get fast action on equipment you want to buy or sell. Buyers are watching for equipment they can use. Convert idle equipment into cash. ICE AND REFRIGERATION classified rates *are low*—results *quick*.

Photograph courtesy the Milwaukee Sentinel

when–

WISCONSIN COLD STORAGE COMPANY

freezes moose browse–

they use VILTER of course

● The Canadian Moose, it seems, becomes a fussy eater when he's put behind bars. Recently the Milwaukee Zoo imported a pair of young moose from the Kenora district in Ontario, and feeding them became an immediate problem. The problem wasn't beyond the Zoo Director, however. He put the Zoo people to work hand-picking oak, willow, maple, dogwood, and honeysuckle leaves, and packing them carefully in boxes.

Next, he sent the boxed browse to Wisconsin Cold Storage Company for fast freezing and zero storage. Now the fussy young moose are thriving on leaves that are as good as fresh—thanks to an alert Director, to Wisconsin Cold Storage, and to the Vilter Refrigeration installed there.

It's no great trick, of course, for Vilter refrigeration to help store frozen leaves for moose. But Vilter refrigeration daily plays a part in unusual and difficult refrigeration installations. No matter how unusual your application, or how rigid your specifications, versatile Vilter refrigeration can be developed to fill the bill. And do it, more than likely, at considerable savings in costs, both now and through the years.

Your nearby Vilter Distributor or Representative will be glad to show you how Vilter equipment and Vilter engineering can help you save money.

Vilter

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY
MILWAUKEE 7, WISCONSIN

Ammonia and Freon Compressors • Pakicers • Evaporative and Shell & Tube Condensers • Pipe Coils • Valves and Fittings • Air Conditioning

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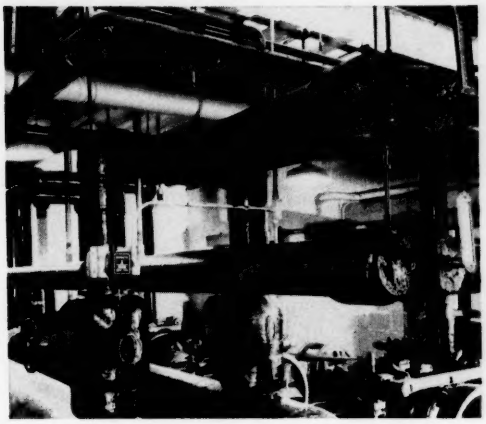
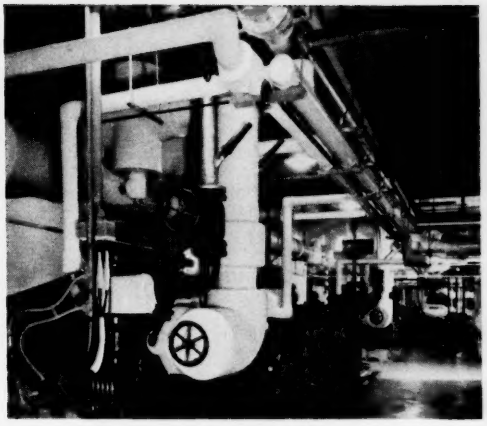


Cold line painted with Cork Covering Paint has neat, shiny black finish.



Sewed canvas provides de luxe finish and can be painted any desired color.

We have been asked . . .

"What's the best finish for cork insulated cold lines?"

A letter we recently received from a hotel engineer presented the following problem: "We are running some refrigeration lines in connection with the air conditioning of our dining rooms and wonder what would be the best finish for the cork covering on these lines."

Here's how we answered him: The proper finish for cork covering should be determined by two things—the conditions surrounding the lines and the desired appearance of the installation.

Where piping runs through dry rooms, the recommended finish for most installations is Armstrong's Cork Covering Paint. This brushed-on asphaltic paint provides a neat, shiny black finish for the line and also reinforces the vapor resistance of the factory-applied asphalt mastic finish on the cork covering.

For areas where a de luxe appearance is desired, the canvas finish is recommended. So that the finished job will be neat and smooth, a layer of rosin-sized paper is wrapped around the covering before 8-oz. canvas is neatly pasted or sewn in place. After the canvas is in place, it can be sized and then painted in any desired color.

Where piping runs through wet or humid atmospheres, refrigerated rooms, pipe shafts, or outdoors, roofing paper should be wired on straight pipe runs and painted with Armstrong's Cork Covering Paint. On fitting covers, Armstrong's Insulmastic, a weatherproof asphaltic compound, should be troweled on over hexagonal wire mesh.

In addition to these finishes, Armstrong can furnish special solvent-proof and fire-resistant finishes for cork pipe covering.

When you have any question about the selection or finishing of cold line insulation, consult the Armstrong engineer. He can furnish sound, practical advice on any insulation problem. The complete contracting organization he represents is equipped to handle any insulation job—offering qualified engineering aid, top-grade materials, and skilled application.

SEND US YOUR QUESTIONS: If you have any questions on the use or application of either high- or low-temperature insulation, please do not hesitate to write to us. We'll do our best to give you a prompt and practical answer. Just address a letter or post card to Armstrong Cork Company, 4503 Concord Street, Lancaster, Pennsylvania.

ARMSTRONG'S INDUSTRIAL INSULATIONS

MATERIALS - INSTALLATION

FOR ALL TEMPERATURES FROM 300°F. BELOW ZERO TO 2800°F.

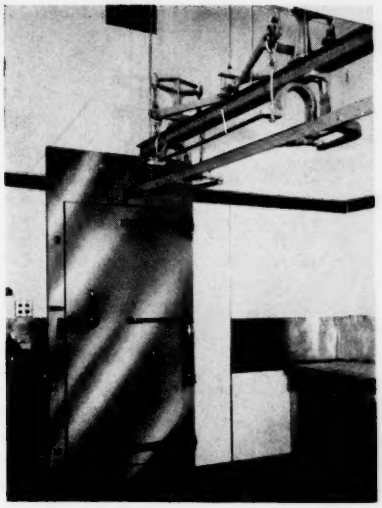
MONEY-SAVING FEATURES

of *JAMISON* doors meet Super Market needs!

TRACK DOOR Speeds Handling

The Jamison Track Door permits fast, economical movement in and out of storage of the large volume of meats and other perishables sold in the modern super market. Stainless steel cladding on door assures the finest in sanitation—easy to keep clean.

DOOR CLOSER Saves Refrigeration



The Jamison automatic door closer, an optional feature, was selected because of its economy. It keeps entry of warm, moist air to a minimum—reduces moisture condensation, saves refrigeration cost. If you want to save money and headaches with your cold storage doors, consult Jamison and insist on Jamison in your specifications. Jamison Cold Storage Door Company, Hagerstown, Maryland, U.S.A.

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

The Leader For Over Fifty Years